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ABSTRACT

This training manual on food preparation consists of 23 detailed lessons, ranging from an orientation to quality food production and the use and advantages of standardized recipes for bakery ingredients to the making of various desserts. Detailed definitions of words related to food preparation and innumerable handouts with titles like "merchandising the salad bar," "labor saving equipment," and "food weight and measure equivalents," are interspersed among class activities and progress tests. An instructor's guide for pie and pastry preparation, as well as recipe sources and measurement tables, form the appendixes. (KS)

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Child Nutrition Programs are available to all eligible children regardless of race, color, or national origin.

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QUANTITY FOOD PREPARATION

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LESSON 1: ORIENTATION TO QUALITY FOOD PRODUCTION

A. GOALS OF THIS LESSON

The goals of this lesson are to develop an awareness of the need to provide quality, nutritious foods acceptable to customer's tastes and pocketbook, and be able to identify quality foods.

B. PURPOSE OF THE LESSON

After completing this lesson, the participants should be able to:

1. know the requirements for producing quality food
2. understand the kitchen layout relationship to work schedule and production of food
3. recognize the interrelationship of menu, production service, and customer acceptance.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of handout materials.
2. Locate a blackboard for use in the classroom.
3. Locate an overhead projector and blank transparency sheets plus a transparency marking pen.

D. KEY WORDS USED IN THIS LESSON

DONATED COMMODITIES: food accepted by the state from the federal government to be used in school food services at a cost of delivery only.

QUALITY FOOD: Foods prepared in a manner acceptable to customers that meets given standards.

E. PROCEDURES FOR CLASS IF FOOD IS TO BE PREPARED AND SERVED

1. Class will be divided into groups.
2. Each group will be assigned a "manager" for each class. The "Manager" will plan her group's work schedule and is responsible for the record-keeping that day.
3. Each group will be assigned the responsibility for setting up the serving counter and serving the lunch on an assigned day.
4. Most of the food preparation will be done by class members, but some preparation will be shown by demonstration.
5. Clean-up is the responsibility of the total group.
6. Because Donated Commodities are used in the preparation, the products made in class may not be taken home by the class members.

F. REFERENCES FOR ADDITIONAL INFORMATION

Terrell, M. Professional Food Preparation, Second Edition, Wiley and Sons, Inc., Somerset, New Jersey ($27.50).

West, B. B., Wood, L., Hayes, V. F., and Shugart, G. S. Food Service in Institutions, Fifth Edition, Wiley and Sons, Inc., Somerset, New Jersey, 1977, ($23.50).

Van Egmond-Pannell, D. School Food Service, Second Edition. AVI Publishing Co., Westport, CT, 1981 ($17.00).

LESSON 1 : ORIENTATION TO QUALITY FOOD PRODUCTION

LESSON CONTENT

I. EXPECTATIONS FOR PARTICIPANTS IN THESE LESSONS:

A. To Improve Their Skills in Providing Quality Food, in Quantity

1. If actual preparation takes place, the basic principles and methods involved in preparing food in quantity to be attractive, tasty and appealing to our customers will be learned by doing.

2. If laboratory experiences are not part of the teaching plan, the class members will learn principles and method of preparation by lecture, demonstration, discussion, and classroom activities.

B. To Understand Kitchen Practices That Reduce Efficiency of the Operation and the Quality of the Food Prepared. They include:

1. using too many processes (steps or actions) in preparing a menu item;

2. using too many pans in preparation;

3. not organizing the work area;

CLASS ACTIVITY

Prior to having participants do any food preparation, a general introduction to the facility is recommended. A suggested outline for this introduction is given in Handout #1-1. This can be done at the beginning or at the end of this lesson.

LESSON 1 : ORIENTATION TO QUALITY FOOD PRODUCTION

LESSON CONTENT | **CLASS ACTIVITY**

4. not cleaning up as we go along;

5. cooking food too far ahead;

6. cooking more food than is needed;

7. not utilizing equipment to the best advantage;

8. lacking imagination in utilizing planned overs (leftovers)

II. PRETESTS SHOULD BE USED TO:

A. See where we all are starting and provide a class baseline;

B. Identify the class participants' knowledge levels.

Distribute pretest and have participants complete it (Handout #1-2).

III. HISTORICAL STORY OF QUALITY, QUANTITY FOOD

A. Past Activities and Events that Had Quantity Food Service:

1. Feasts of kings and emperors of ancient Egypt, Persia and Israel;

LESSON CONTENT	CLASS ACTIVITY

2. Julius Caesar celebrated one of his military triumphs with a feast for 260,000 people that lasted several days;

3. King Richard II served 10,000 people daily with 2,000 cooks and 300 helpers;

4. During the sixteenth century, new foods like turkey, potatoes, corn, coffee, and chocolate were introduced after Columbus's ocean trips. Italian cuisine also was introduced to France with the marriage of Catherine de Medici of Florence to Henry II of France.

B. Historical Organizational Procedures

1. Roman cooks organized their kitchens for production by dividing the work into specialized tasks. They used meat, fish and birds with highly spiced sauces.

2. The French Revolution turned society upside-down; many fine chefs found themselves without jobs. They began to open restaurants in Paris, and within 20 years, there were 500 restaurants in the area.

C. Personnel

1. Chefs were men of importance. King Charles VI of France knighted his chef.

2. Georges Auguste Escoffier was the most famous chef from 1880-1920, because of his expertise. Both apprenticeships and cooking schools flourished in this era because of his participation and encouragement.

D. Equipment

1. During the last 100 years, more changes have occurred in the kitchen and in cooking than in the thousands of years preceding it.

2. Gas and electricity were used for cooking. Cooling and freezing were used for storage and cooking.

IV. D. REVIEW STEPS TOWARD PRODUCING QUALITY FOODS

A. Factors Related to Preparation Include:

1. Purchasing:

a. Food produced is no better than the ingredients used in making it

LESSON CONTENT	CLASS ACTIVITY
b. Buy appropriate variety (fancy, standard) and form (fresh, frozen, canned) 2. Proper handling of purchased and delivered items 3. Timing in the scheduling of work assignments: a. Preplanning and preparation the day before to make work more efficient b. Determine quality standard c. Determine if you should cook in one batch or cook throughout the meal period 4. Clarity of instruction: a. Recipe accurate, complete and standardized b. Known size of serving and set-up	

LESSON 1 : ORIENTATION TO QUALITY FOOD PRODUCTION

LESSON CONTENT	CLASS ACTIVITY
5. Sanitation a. Applied to preparation and handling of food from beginning to end b. Personal habits: (1) Dress: a neat, clean, orderly appearance including hairnet or hair restraint that complies with health department regulations and is a prerequisite for orderly work habits. (2) Handwashing: hands should be washed frequently; always after going to the restroom and handling objects that might cause contamination. (3) Not working around food: when employee has a cold, temperature, open sore, rash or skin outbreak. 6. Presentation of food: a. People eat with their eyes	Lead a discussion on the need for sanitary conditions for quality food preparation. Focus on keeping hair, dirt and insects out of the food.

LESSON CONTENT	CLASS ACTIVITY
b. What they see and how it tastes are the criteria by which food service is judged as well as the manner in which the food is served.	
7. Understanding of cooking terms and preparation methods help to interpret the recipe accurately:	Use Handout #1-3 to discuss definitions of food service preparation or review with examples from local menu selection.
a. Definition list, Handout #1-3, provides basic food preparation.	
B. Quality Assurance Is Obtained By:	Write a selection of words on a transparency and see if participants can give a definition of the word. Then distribute definition Handout #1-3 at end of lesson.
1. Understanding basic principles of food preparation;	
2. Using correct temperatures during the entire process of purchasing, preparation	
3. Using thermometers to ensure standard, accurate cooking and holding temperatures;	
4. Selecting the correct ingredients;	
5. Using standardized recipes;	

LESSON 1 : ORIENTATION TO QUALITY FOOD PRODUCTION

LESSON CONTENT	CLASS ACTIVITY
6. Giving tender loving care; 7. Using the team approach for excellence.	

HANDOUT #1-1

SUGGESTED INTRODUCTION FOR QUANTITY FOOD PREPARATION

If the class is to be a completely hands on experience, the ground rules will have to be determined immediately. Most of the same procedures would be used for lecture-demonstration class. These activities tend to put people at their ease.

A. Roll call

1. Class members introduce themselves.
2. Give their name, school and present job assignment.

B. Instructor outline ground rules of the course:

1. Purpose of class
2. Tentative class schedule
3. Class organization and regulations for receiving credit
4. Information
    a. where to park
    b. what door to use
    c. when and where smoking is permitted
    *d. where to keep purses
    *e. where to meet for discussions
    *f. how food products will be displayed for analysis
    *g. team approach to preparation, set up service and clean up
5. Plan to have fun and enjoy learning and teaching
6. Rules of the course can be duplicated so that each class member will have them for a reference. Specific information for a given location must be developed by the instructor.

*If class is conducted with laboratory

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HANDOUT #1-2

QUANTITY FOOD PREPARATION PRETEST

DIRECTIONS: Read each statement completely and then decide whether the statement is a true or false statement. Place a T for a true statement in the blank before the number or an F for a false statement.

____1. Vegetables should be cooked in small batches.

____2. Cutting square biscuits requires less time and energy than using a round biscuit cutter.

____3. Enriched rice should be washed before cooking.

____4. Roasts and poultry should be sliced immediately after cooking.

____5. Measuring always has increased accuracy over weighing.

____6. "Whipping" puts air into light mixtures, such as egg whites.

____7. Moist heat cookery makes less tender cuts of meat more tender.

____8. Portion size is not important when using standardized recipes.

____9. Butter sauce is a good carrier of additional seasonings.

___10. To "cream" a mixture means adding dairy cream to the preparations.

___11. Vegetables should be cooked in large amounts of water.

___12. Most harmful bacteria are killed at 165°F (73.8°C).

____13. To keep cauliflower white during cooking, blanch it first.

____14. Thawing should take place at room temperature.

____15. Steaming of foods is only done under pressure.

____16. All recipes should be doubled by doubling all ingredients.

____17. Textured vegetable protein can be used in combination with meat, poultry or fish to replace up to 30% of the meat requirement.

____18. A rich dough batter is one that contains a high proportion of fat or shortening.

____19. Stuffing for poultry should be baked separately.

____20. Pan-broiling is another term for par-boiling.

____21. Using standardized recipes helps reduce food and labor expenses.

____22. A roux is a mixture of butter (or other fat) and flour cooked.

____23. In order to get the best flavor for stock, meat bones should be in boiling water.

____24. The quality and quantity of food are always directly related.

____25. Sandwiches should be stacked no higher than 3 to refrigerate properly.

____26. The scoop number indicates the number of scoops per gallon.

____27. Making your own hamburger buns and breads on site is always a cost-effective measure.

____28. Blanching allows for easier peeling of some fruits.

____29. Canned vegetables are already cooked.

____30. Boiling and scalding are the same cooking process.

____31. It is permissible to put frozen food in warm water to thaw.

____32. Roasting is the same as baking when preparing meats.

____33. Low temperatures should be used when cooking with milk.

____34. Serving spoons are marked with serving size.

____35. Quick breads are usually well-mixed to develop tenderness.

____36. Marinades break down connective tissues in meats.

____37. The only way to accurately determine internal meat temperature is with a meat thermometer.

____38. Fruit crispe flavor is improved when warmed.

____39. Fried eggs and dried egg mix are commodity items that can be used interchangeably in a recipe.

____40. The use of standardized recipes helps ensure quality foods.

____41. Foods once thawed and not cooked can be refrozen.

____42. Overcooked vegetables lose nutritive value.

____43. Fish should generally be cooked at a high temperature.

____44. Canned pineapple contains an enzyme which causes gelatin to have a rubbery or gummy bottom layer.

____45. The telephone number of the fire and police departments should be in a prominent spot near the phone.

____46. The oven hood filters should be thrown away and replaced every month.

____47. A three-compartment sink should be used for preparation of foods and for washing pots and pans.

____48. Prolonged cooking of yellow vegetables will cause the sugar to carmelize.

____49. All flours are refined and bleached.

____50. The leavening agent for biscuits is yeast.

____51. Yeast grows best between 78-90°F.

____52. Work simplification means buying convenience foods.

____53. Proofing a dough means putting dough in the refrigerator tightly wrapped.

____54. Fricassee means any food or combination of food braised or simmered.

____55. Julienne means cut in long, thin strips.

____56. Colanders, china caps and sieves are utensils used to drain canned fruits such as peaches or pears.

____57. High acid fruits can weaken a gelatin salad.

____58. A green ring formation around the yolk of hard-cooked eggs may be reduced by cooking at low temperature and quickly chilling after cooking.

____59. The most frequent problem in fish preparation is overcooking.

____60. Leftover spaghetti with meat sauce should be cooled to room temperature before refrigerating.

____61. Production sheets provide information concerning pre-preparation.

____62. Always store baked goods in the refrigerator to maintain freshness.

____63. Prewashed salad greens should be stored in plastic bags with plenty of water.

____64. Pot cheese is drained curd.

Handout #1-3

DEFINITIONS RELATED TO FOOD SERVICE PREPARATION

1. **ANTIPASTO** - appetizers of fish, vegetables or cold cuts. Italian origin meaning, "before the pasta."

2. **ASPIC** - a jelly substance made from meat, fish, vegetable or fruit juice which has been thickened with gelatin.

3. **AUGRATIN** - food creamed or moistened with other ingredients (eggs, milk, stock), covered with bread crumbs and cheese, and baked until top is brown.

4. **BABA** - rich yeast cake, flavored with rum sauce or fruit juice.

5. **BAKE** - to cook by dry heat (usually in an oven) on heated metals. (Baking means the same as roasting when applied to meat cookery.)

6. **BASTE** - to moisten meat or other food while cooking in order to add flavor, and to prevent drying of the surface. (The liquid is usually fat, drippings, water, or water and fat.)

7. **BATTER** - a blended mixture of flour, liquid and other ingredients thin enough to pour.

8. **BEAT** - to make a mixture smooth or introduce air by using a brisk regular motion to lift the ingredients over and over.

9. **BISQUE** - puree of shellfish, meat or vegetables made into a thick soup, often with cream.

10. **BLANCH** - to precook or pretreat in boiling water or steam or possibly in fat. Blanching is used:
    (a) to aid in removing skins from fruits and nuts;
    (b) to precook in deep fat without browning, as a first step in preparing french fried potatoes.

11. BLEND - to thoroughly mix two or more ingredients. This is often done with a mixer at low speed.

12. BOIL - to cook in a liquid (water or mostly water) in which the bubbles are breaking on the surface, and steam is being given off.

13. BOUILLABAISSE - a fish stew having five or six kinds of fish, white wine, garlic, parsley, tomatoes, pepper, bay leaf.

14. BOUQUET-GARNI - tied bunch of aromatic herbs, such as parsley, thyme, bay leaf, and rosemary, used to flavor soups, stews and sauces. It is removed before serving.

15. BRAISE - to brown meat or vegetables in a small amount of fat, add a small amount of liquid, cover tightly and cook slowly. (The liquid may be water, milk, cream, or meat stock.)

16. BREAD - to coat with bread crumbs or cracker meal; to coat with crumbs, then with lightly diluted egg, and again with crumbs.

17. BROIL - to cook by direct heat; grill.

18. BROTH - a thin soup or water in which meat or vegetables have been cooked.

19. CARMELIZE - to heat sugar or food containing sugar until a brown color and characteristic flavor develop.

20. COAT THE SPOON - to cover a spoon dipped into a mixture with a distinct film which adheres to the bowl of the spoon after removing from the mixture.

21. CHOP - to cut food into fairly fine pieces with a knife or other sharp tool.

22. CHOWDER - a thick soup of fish or vegetables and milk.

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23. CLARIFY - to make clear by skimming or by adding egg whites and straining.

24. CREAM - to mix one or more foods, such as fat and sugar, to incorporate air.

25. CREOLE - food containing tomatoes, green pepper and onions.

26. CRISP - make firm and brittle, as in chilling vegetables or drying food in the oven.

27. CROUTONS - bread cubes, toasted or fried for use in garnishing soup or salads.

28. CUBE - to cut in small squares about ½-inch in size.

29. CUT - to separate food into pieces with a knife or scissors.

30. CUT IN - cut fat into flour with knives or a blender until fat particles are of the desired size.

31. DASH - less than $\frac{1}{8}$ teaspoon of an ingredient.

32. DICE - to cut in small cubes about ¼-inch in size.

33. DOT - to scatter bits of food, as butter or margarine, over other foods.

34. DOUGH - a flour and liquid mixture thick enough to handle with the hands.

35. DREDGE - to sprinkle, dust, or coat with flour or other fine substances.

36. DRIPPINGS - the residue left in the pan in which meat or poultry has been cooked.

37. DUST - to sprinkle lightly with flour or sugar.

38. **ENCHILADA** - a Mexican dish. Tortillas dipped in hot fat, then in hot sauce, filled with onion, lettuce and cheese, rolled up and topped with sauce or made into a stack of three with filling between and topped with a fried egg.

39. **ESCALLOPED OR SCALLOPED** - food baked in a dish with bread crumbs. Sauce or liquids may be arranged in layers with the food or mixed together before putting in the dish.

40. **FLAKE** - to break into small pieces.

41. **FOLD IN** - to combine ingredients, while retaining incorporated air, by cutting carefully down through the mixture with an implement, sliding the implement across the bottom of the mixing bowl, and turning the mixture over in this manner several times.

42. **FRICASSEE** - to cook by braising. (This term is usually applied to fowl, rabbit, or veal which is cut into pieces.)

43. **FRY** - to cook in hot fat. When a small amount of hot fat is used, it is called "sauté," or pan frying. When immersed in deep fat, it is called deep fat frying.

44. **GARNISH** - decorate a dish or plate to add texture or color and more appeal to the eye.

45. **GLAZE** - to baste frequently with a sugar syrup until a glossy coating is formed on the food.

46. **GRATE** - to reduce to small particles by rubbing on a grater.

47. **GRILL** - to fry on a griddle; sauté or toast.

48. **GRITS** - coarsely ground corn.

49. **GUMBO** - a soup thickened with okra or filé.

50. HOLLANDAISE - sauce of eggs, butter, lemon juice, and seasonings served hot with vegetables or fish.

51. HUSH PUPPIES - deep fat fried cornmeal paste.

52. JULIENNE - anything cut in long, match-like strips.

53. KNEAD - to work a dough with a pressing motion by folding and stretching to develop gluten.

54. LARD - to insert strips of fat into or on the top of uncooked lean meat, poulty or fish to give flavor and prevent dryness.

55. MACEDOINE - a mixture of vegetables or fruits.

56. MARINATE - to treat with a marinade (an oil-acid mixture) which is usually like a salad dressing. (The process imparts flavor, and when used with meats, some tenderizing action takes place.)

57. MASK - to cover completely with sauce, jelly or mayonnaise.

58. MELT - to liquify by the application of heat.

59. MINCE - to cut or chop food into very small pieces.

60. MIX - to combine ingredients in any way that effects even distribution.

61. MOLD - to form dough or other mixture into loaves or other desired shapes or to place a gelatin mixture into a mold to jell.

62. MULLIGATAWNY - East Indian soup flavored with curry and other spices.

63. MOCHA - coffee-flavored, or a combination of chocolate and coffee.

64. PAN-BROIL - to cook uncovered on a hot surface (usually a frying pan); the fat is poured off as it accumulates.

65. PARBOIL - to boil until partially cooked. (The cooking is completed by another method.)

66. PARE - to cut off the outside covering (usually with a knife).

67. PEEL - to remove or strip off the outside covering (usually with a knife).

68. PUREE - to finely strain fruits or vegetables.

69. ROAST - the same as to bake. (The term is mostly applied to meats.)

70. ROUX - [illegible] an equal portion of fat and flour.

71. SANITIZE - to destroy microorganisms. (For culinary purposes, this is most often done at a temperature of 180°F, or by chemicals.)

72. SAUCES -
Béarnaise: egg yolks, vinegar, butter, onions, and spices.
Béchamel: white sauce made by stirring equal portions of chicken stock and light cream into a light roux.
Bordelaise: a brown sauce with butter, meat stock, red or white wine, onions, carrots and bay leaf.
Mornay: a thick cream, eggs, cheese, and seasoning.
Veloute: white sauce with chicken or veal stock.

73. SAUTE - to cook in a small amount of fat. (This process is also called pan-frying.)

74. SCALD - to heat a liquid to just below the boiling point.

75. SCORE - to cut narrow grooves or gashes part way through the outer surface of food.

76. SEAR - to brown surface of meat by the quick application of intense heat, usually in a hot pan or in a hot oven. SHRINKAGE of meat is increased.

77. **SHRED** - to tear or cut into small, long narrow strips (similar to sliver).

78. **SIMMER** - to cook in a liquid just below the boiling point (185°-210°F). The bubbles form slowly and break below the surface.

79. **SKEWER** - to fasten meat or poultry with wooden or metal pins to hold in shape during cooking.

80. **STROGANOFF** - sauteed beef in sauce of sour cream, with mushrooms and onions.

81. **SLIVER** - to cut or shred into small pieces.

82. **STEAM** - to cook in steam with or without pressure.

83. **STEEP** - to cover with boiling liquid and let stand over a long period of time in order to extract flavor, color or other qualities.

84. **STEW** - to simmer in a large quantity of liquid. (When applied to meat, a simmering temperature is maintained.)

85. **STIR** - to mix food materials with a circular motion in order to blend or to secure a uniform consistency.

86. **STOCK** - the liquid in which meat, poultry, fish or vegetables have been cooked.

87. **TACOS** - rolled Mexican sandwich of tortillas filled with meat, lettuce, onion, and hot sauce.

88. **TAMALE** - highly seasoned Mexican mixture rolled in cornmeal mush and wrapped in corn husks and steamed.

89. **TARTAR SAUCE** - mayonnaise to which chopped dill or sour pickle, green onions and chives have been added.

90. TOAST - to brown by means of direct heat.

91. TORTE - a rich cake made with crumbs, eggs and nuts or meringue in the form of a cake.

92. WHIP - to beat rapidly to produce expansion due to incorporation of air (applied to cream, eggs, gelatin mixture).

93. WIENER SCHNITZEL - breaded veal cutlet served with lemon.

94. WANTON - stuffed dumplings cooked in chicken broth.

95. YORKSHIRE PUDDING - English popover batter baked in roast beef drippings.

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LESSON 2 : STANDARDIZED RECIPES

A. GOAL OF THIS LESSON

The goal of this lesson is to demonstrate the importance of using standardized recipes.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. recognize what a standardized recipe is;
2. identify the advantages of using standardized recipes;
3. identify a well-written quantity recipe for format and wording;
4. convert a given base recipe to an adjusted amount, correctly.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.
2. Suggest that participants bring hand calculators to class for this lesson.
3. Locate a chalk board to use in the classroom.

4. At least 10 weeks before showing, locate and arrange for films for this lesson.

    a. "Using Standardized Recipes," No. 1-159A, from State Library Services, 135 E. Michigan, P. O. Box 3007, Lansing, Michigan 48909. Phone: 1 - 517 - 374 - 9633 for additional information, confirmation date, or order forms.

5. Collect recipes used in kitchens for class activity.

6. Collect family recipes for class activity.

D. KEY WORDS USED IN THIS LESSON

RECIPE: A formula for preparing a dish in cookery; a method to attain a desired end; written directions for preparing an item.

RECIPE ADJUSTMENT: Converting and standardizing recipes to different amounts.

STANDARDIZED RECIPE: A recipe which is used without deviation or changes each time a product is prepared. It is consistent in terms of yield, taste and quality.

FACTOR: A multiplier for each ingredient in the recipe to increase or decrease from original recipe. This number is determined by dividing the recipe's existing number of servings into the desired number of servings.

YIELD: The number of portions produced from a given recipe.

E. REFERENCES FOR ADDITIONAL INFORMATION

·Aldrich, P. J., and Miller, G. Standardizing Recipes for Institutional Use. Circular Bulletin 223. Agricultural Experimental Station, Michigan State University, 1963. (See Appendix for excerpts.) (Now out of print.)

·Fowler, S. Food for Fifty, Sixth Edition. New York: John Wiley and Sons, 1971. (Now out of print.)

Kotschevar, L. H. Standards, Principles and Techniques in Quantity Food Production. Boston, Massachusetts: Cahners Books, Division of CBI Publishing Co., Inc., 1974.

Morgan, W. Supervision and Management of Quality Level Production. Berkeley, California, 1972.

LESSON 2 : STANDARDIZED RECIPES

LESSON CONTENT

I. RECIPES ARE:

- A. Communication Tools
- B. Abbreviated Ways of Passing Information From One Person To Another; from someone who knows how to make a certain product to someone who wants to make it.

II. STANDARDIZED RECIPES

- A. Have Been Tested;
- B. Are Proven To Provide a Given Number of Servings;
- C. Have Produced a High Quality End Product;
- D. Are Standardized Only for the Operation in Which It Was Tested.
  1. Many people have the mistaken idea that the term 'standardized recipe' means it contains a foolproof set of ingredients, amounts and instructions that will work every time in every kitchen for every cook. Not so!

CLASS ACTIVITY

The film, "Using Standardized Recipes," is a good introduction to the lesson, as it provides basic information on measuring, and following a recipe to give same results every time.

LESSON CONTENT	CLASS ACTIVITY

2. If you take a recipe standardized for one kitchen into another with a different set of circumstances (cook, equipment, student preference), it may work or it may not.

3. If it does not work, adjustments may be made in the recipe so that it fits the equipment, cooks and customers. When all these changes have been made, it then becomes a standardized recipe in that operation.

III. STANDARDIZED RECIPES HAVE MANY ADVANTAGES

A. Prevents Waste and Leftovers Because the Total Amount Made Is Known in Advance.

B. Assures Uniform Quality Because Recipes Have Been Tested.

C. Saves Time By Eliminating Guess Work By Cooks and Manager/Directors.

D. Reduces Waste:

1. In over-purchasing which may happen if recipes are not available;

2. In over-production which may produce unusable leftovers that have to be discarded at the end of a meal period.

LESSON CONTENT | **CLASS ACTIVITY**

E. Simplifies Precosting of Menu Items Because the Precise Data Contained in the Recipe Enables Easy Calculation of the Cost Per Serving.

F. Provides Purchasing Information by Designating Exact Amounts of Foods Needed for Specific Amounts to Be Made.

G. Makes It Easier For an Employee To Prepare an Item and Thus Save Labor Hours and Improve the Quality of the End Product.

H. Reduces the Possibility of End Products Being Influenced By the Whims and Personal Preferences of the Individuals (sweetness or saltiness).

I. Provides Ingredient Record That Is Easily Transferred To Meal Pattern Allowance.

J. Saves Time for the Manager/Director In Routine Preparation Tasks and Frees Him/Her For Other Supervisory Tasks.

IV. BIASES AGAINST STANDARDIZED RECIPES

A. Eliminates Individuality Since the Results Are Always the Same.

LESSON CONTENT	CLASS ACTIVITY

B. Is Inconvenient If There Is Not Enough Measuring Equipment.

C. Is Too Much Work.

V. QUANTITY RECIPE FORMAT

A. The More Information the Recipe Provides, the Easier It Is For Anyone To Follow the Directions When Preparing the Item.

B. The Following Information Should Be Included:

1. Name of Food Item;
2. A file code number;
3. Total quantity and/or the number of portions of a specific size to be obtained;
4. Ingredients by weight and/or measure (volume) and sometimes by count;
5. Procedures and approximate times for combining ingredients;
6. Cooking or baking temperatures and times;

LESSON CONTENT	CLASS ACTIVITY
7. Panning or portioning information; 8. Cost information; 9. The standard of quality expected in the end product; 10. The total time required for producing the recipe. C. The first 7 items listed above are very common on quantity recipes. The last 3 are not as common, but are useful for manager/directors to make more accurate operational decisions.	
VI. SUCCESSFUL GUIDELINES FOR QUANTITY RECIPE FORMAT A. Use Large Print and Do Not Crowd. Lines help to separate ingredients handled together in each procedure. B. Use 5 x 8 Inch Cards, 6 x 8 Inch Cards, or Notebook with 8½ x 11 Inch Paper. C. Place the Title At the Top Center, and the Filing or Index Code Number at the Top Right.	Collect a variety of recipes that are used in kitchens and discuss with the class or have participants bring to class an example of a good and a poor recipe from their area.

LESSON 2 : STANDARDIZED RECIPES

LESSON CONTENT

D. List the Portion Size Below the Title on the Right Hand Side.

E. List Total Yield and Portions Opposite the Portion Size on the Left Hand Side.

F. State the Work To Be Done in Advance Under 'Procedures.'

G. List Ingredients in Order of Use on the Left Hand Side.

1. Descriptive terms before the ingredient indicate type or style to be purchased, or cooking needs such as canned corn, cooked rice.
2. Descriptive terms after the ingredient indicate preparation needs, such as onions chopped, bananas sliced.
3. Procedures for handling ingredients are on the right hand side.
4. Between these two entries, list the weights, measures or counts of each ingredient. Count may be indicated beneath or beside the measured amounts of ingredients in parentheses.

CLASS ACTIVITY

Handout #2-1. Samples of the various formats for recipes.

LESSON CONTENT

5. Do not use abbreviations in the procedure narrative.

6. Number procedures in sequence, arranging them opposite the ingredients used.

H. Leave An Extra Column for Adjusting Weights and Measures of Ingredients When Converting a Recipe to Another Amount, Leaving It When Possible For Costing Information.

I. List Panning Instructions at the Bottom of the Recipe After All Procedures Are Noted.

VII. CONVERTING AND STANDARDIZING RECIPES TO DIFFERENT AMOUNTS

A. Recipes May Need To Be Adapted or Standardized To Your Operation.

1. To change a home recipe to quantity:

a. Decide the recipe is something you want to try.

b. Prepare the recipe and evaluate for acceptance, method, yield and cost. A final evaluation for acceptance should be done by a panel composed of kitchen personnel and management and perhaps students.

CLASS ACTIVITY

Class members can bring family-size recipes to class, and as a class activity or small group discuss the acceptability of the recipe and how to adapt them for their operation. Cost of each recipe should include labor as well as food cost in determining feasibility of

LESSON CONTENT

c. Double the original recipe and then evaluate for quality, yield and cost.

d. Double again and compare product with original version.

e. When recipe has been prepared for 24 or 25 servings, the evaluation group should include kitchen staff, management and student or student-parent advisory groups.

2. When the recipe has been prepared for 24 or 25 portions, further increasing can be done in the regular manner by factor or direct reading.

B. Methods To Increase or Decrease Quantity Recipes.

1. Two methods are generally accepted to increase or decrease a recipe. The method you choose should be the easiest for you to do.

   a. The Factor Method of adjustment requires both calculation and concentration to assure accuracy.

   b. The Direct-Reading table can be used successfully when changes are in 25-portion increments.

CLASS ACTIVITY

preparation. Since costs cannot be determined ahead of time, the class exercise would be all educated guess for ingredients from home prices.

LESSON CONTENT

2. To Use the Factor Method of Adjustment:

   a. Divide the desired yield by the known yield to obtain your factor. For example, if you wish to prepare 85 servings and the recipe is for 25 servings, divide 85 by 25.

$$\frac{85}{25} = 3.4 \text{ (factor)}$$

$$\frac{\text{required no. of servings}}{\text{original recipe no. servings}} = \text{factor}$$

   b. Increase the batch sizes if the factor is more than 1.0; decrease the batch size if the factor is less than 1.0.

   c. Convert to weight all amounts of ingredients given in the original recipe.

   d. Multiply the amount of each ingredient in the original recipe by the factor.

   e. Round off carefully the new calculated amount of each ingredient to usable measurements and/or weights.

CLASS ACTIVITY

Instructor can best explain the factor method by going through the steps with the class. Handout #2-3 is a simplified recipe and amounts which would be a good introduction to the factor method.

Review Handout #2-4, Guide for Rounding Off Weights and Measures, during this discussion.

LESSON 2 : STANDARDIZED RECIPES

LESSON CONTENT

(1) For example, the conventional measuring spoon set contains ¼ tsp, ½ tsp, 1 tsp, and 1 Tbspn. Therefore, fractional measures of ⅓ tsp, and ⅝ tsp are not usable measures. Try rounding them to ¼ tsp, and ½ tsp.

(2) Care needs to be taken when measuring seasonings and spices. It is advisable to use less amounts until the recipe has been tested to see if it meets your needs.

f. Adapt the method for your kitchen; include equipment, pans and any necessary things. The factor method is the most widely used procedure for recipe adjustment.

3. To Use the Direct Reading Table Method:

a. Limit to recipe adjustments that can be divided by 25.

b. Refer to Tables 1-3 of Standardized Recipes For Institutional Use (see Appendix).

CLASS ACTIVITY

Distribute and complete Handout #2-5, a recipe conversion exercise for macaroni salad. Handout #2-6, another factor recipe conversion, may be used as a class exercise if time permits, or as a homework assignment.

LESSON CONTENT	CLASS ACTIVITY

c. Locate the column which corresponds to the original yield of the recipe you wish to adjust.

d. Run your finger down this column until you come to the amount of the first ingredient in the recipe.

e. Run your finger across the page in line with the amount, until you come to the column which is headed to correspond with the yield you desire.

f. Record this figure as the amount of the ingredient required for the new yield.

g. Repeat Steps 1-3 for each ingredient in the recipe.

VIII. PROBLEMS IF RECIPES ARE NOT CONVERTED AND STANDARDIZED

A. Cooks May Arbitrarily Double or Triple a Recipe Hoping That They Guessed Correctly and Won't Run Out of Food or Have Too Much Left.

1. This is a poor method to use in determining production needs.

LESSON CONTENT	CLASS ACTIVITY

2. The manager/director should determine specific numbers of portions needed based on past usage and current customer preferences. Then convert the recipes to match these forecasts.

3. Forecasting keeps leftovers to a minimum and prevents food run-outs most of the time.

B. Recipes Not Tested and Standardized in a Specific Kitchen Have Unsatisfactory Results. For example:

1. A recipe may not have the flavor, texture, consistency or appearance preferred by your customers. They won't eat it and you are left with large quantities of leftovers.

2. A recipe may require different cooking or baking times in your equipment. A test run of a small batch of the recipe is the best way to determine this.

3. There could be a printing error in the recipe; an ingredient may have been left out or printed in the wrong amount. Only a test in advance of serving the item will tell you this so that a correction can be made.

LESSON CONTENT

IX. SOURCES OF QUANTITY RECIPES

A. Textbooks and Published Recipe Files.

B. Local, State and National Food Professional Meetings and Trade Shows.

C. Trade Associations and Commercial Food Companies.

X. RECIPE STANDARDIZATION IS A CONTINUOUS PROCESS AND SHOULD REFLECT OPERATIONAL PRACTICES.

A. Color Code Recipes to Reflect the State of Recipe Standardization.

Color Code	State of Recipe
White	Standardized for Operation
Blue	Working on Standardization
Yellow	Recipe Has Not Been Standardized

B. Evaluate Current Recipes for Acceptance with Student and Parent Advisory Groups.

C. Read and Collect Recipe Ideas From Magazines and Professional Publications.

D. Always Look for Improvement.

CLASS ACTIVITY

Handout #2-7 identifies sources of recipes available to you. These recipes will need to be standardized for your operation.

Handout #2-7 is found in the Appendix.

Handout #2-1

SAMPLE RECIPE FORMATS

17. **HARVARD BEETS**

Time of Preparation — Size of Serving: ½ cup

Ingredients	100	150	175
Beets	4 #10	6 #10	7 #10
Sauce			
Sugar	1# 8 oz.	2# 4 oz.	2# 7 oz.
Salt	2 oz.	3 oz.	3½ oz.
Cornstarch	8 oz.	12 oz.	14 oz.
Beet Juice or Water	4 qt.	6 qt.	7 qt.
Butter	8 oz.	12 oz.	14 oz.
Vinegar	3 cups	4½ cups	5½ cups

Method:

1. Drain beets
2. Heat beet juice
3. Mix dry ingredients
4. Add hot juice to dry ingredients stirring constantly. Cook until thick.
5. Add butter and vinegar.
6. Add sauce to beets and reheat.
7. Put in __________ pan.

Cost Per Serving:__________

Total Production Time: 9/30/81

Handout #2-1

SAMPLE RECIPE FORMATS

SCALLOPED HAM WITH POTATOES

(Each portion 1 cup)

100 Portions	Weights	or	Measure
Water	2 gal.		2 gal.
Potatoes, A.P., fresh	30#		4½ gal.
Ham, smoked	50#		50#
Shortening	3#		1 - ¾ qt.
Flour, hard wheat, sifted	1-½#		1 - ½ qt.
Milk, liquid, hot	2 gal.		2 gal.
Pepper	2 tsp.		2 tsp

1. Peel and cube potatoes. Boil in 2 gal. of unsalted water until almost done.
2. Bone and cube ham into 1" cubes. Parboil 15 min. Drain.
3. Combine shortening and flour into a roux. Add with seasoning to hot milk. Cook ten minutes or until cream sauce is done.
4. Combine ham and potatoes. Place in roasting pans.
5. Cover with cream sauce. Mix and bake in moderate oven (350°F) - 45 minutes.

NOTE: 4½ pounds of diced dehydrated potatoes may be substituted for fresh potatoes.

Cost per Serving: __________

Total Production Time:

9/30/81

Handout #2-2

QUANTITY RECIPE FORMAT EXERCISE

Have each participant review the recipe below. Circle or note 5 strong points and 5 errors in the format of this recipe as given. Discuss with the class the results of your review.

VANILLA PUDDING

2½ Gal. = 120 #12 scoops

Desserts 2-1

INGREDIENTS	AMOUNT 2½ Gallons	PROCEDURE
Nonfat dry milk Sugar Warm water	1 lb. 7 oz. 1 lb. 2 oz. 1 gal.	Blend dry milk and sugar. Sprinkle dry mixture on water in unheated steam kettle or top of a double boiler. Stir gently with whip til dissolved. Turn on heat. Scald. DO NOT BOIL.
Cornstarch Cold water Egg yolks	12 oz. 1½ qts. 14 oz.	Blend cornstarch and water. Add egg yolks and blend well. Add egg mixture to scalded mixture. Blend well with whip. (A solid flat stirrer will not give a smooth texture.) Cook over LOW heat to 165°F, stirring continuously til thickened and smooth. Cooking process should take about 18-20 min. for a 2½ gallon batch. Remove from heat.
Butter Salt Vanilla	8 oz. 2½ tsp. 3 Tbsp.	Add these ingredients and blend well.
Egg whites Sugar	1 lb. 6 oz. 1 lb.	USE EGG WHITES AT ROOM TEMPERATURE. Using whip attachment, beat together on 2nd speed of mixer til meringue is stiff but not dry (about 8 min. for 2½ gallon batch). Pour hot custard-mix OVER meringue, folding mixture with whip til no flecks of meringue remain.

Handout #2-2

QUANTITY RECIPE FORMAT EXERCISE (cont.)

INGREDIENTS	AMOUNT	PROCEDURE
		Partially cool before dishing. Using #12 scoop portion into stemmed sherbert cups and garnish with small gelatin cubes (red) and fresh mint or other garnish as specified. Store in pantry refrigerator til needed for service.

Adapted from: Aldrich, P. J., and Miller, G. A. "Preparing Finer Food in Quantity with Dried Milk." Agricultural Experimental Station Bulletin #236, Michigan State University, 1964.

Cost per Serving:__________

Total Production Time:__________

8/1/64

Handout #2-2a

NOTES TO INSTRUCTOR FOR QUANTITY RECIPE FORMAT EXERCISE

Possible Strong Points on Recipe Format

Important points in procedure are capitalized.
Procedures give specific details on preparation.
Approximate preparation times are given in procedures.
Porticning details are given plus garnishing requirements.
The recipe title and file number are correctly placed.
Ingredients are listed opposite procedures that describe them.

Possible Errors in Recipe Format

Steps in procedures not numbered.
Procedure appears crowded; needs more space between items noted.
Egg whites are to be room temperature; should be mentioned as first instruction.
The type of sugar should be specified.
Temperatures such as "warm water" and "partially cool" are not specific, and are left to the interpretation of the cook.
In procedure the phrase "18-20 min." should read "18 to 20 minutes." There should be no dash between the numbers and minutes should not be abbreviated.
There should be no periods after lb., gal., qts., and quarts should be singular (qt).
Egg yolks and whites should have a count included in parentheses to make preparation easier if shell eggs are used.
Abbreviations for teaspoon and tablespoon should be "t" and "T" respectively.

NOTE: There may be other items identified by participants that should be appropriate for these two tests.

Handout #2-3

SIMPLIFIED RECIPE FOR FACTOR METHOD EXERCISE

WIMPIES				
Ingredients	25 servings Tested amount	Factor	85 servings New amount	85 servings "Rounded Off" Amount
Ground beef	3 lbs	x 3.4	10.2 lbs	10 lbs 4 oz.
Onions, chopped	4 oz.	x 3.4	13.6 oz.	14 oz.
Fat	2 oz.	x 3.4	6.8 oz.	7 oz.
Salt	2¼ tsp	x 3.4	7.65 tsp	(& $\frac{3}{4}$ t) or 2 T 1$\frac{3}{4}$ t.
Pepper	¼ tsp	x 3.4	.85 tsp	$\frac{3}{4}$ tsp.
Tomatoes	1 lb. 10 oz. (26 oz)	x 3.4	88.4 oz.	(5 lbs 8.4 oz) or 5 lbs 8 oz.
Catsup	1 lb 13 oz. (29 oz.)	x 3.4	98.6 oz.	(6 lbs 2.6 oz.) or 6 lbs 3 oz.
Kidney beans, chopped	1 lb 11 oz. (27 oz)	x 3.4	91.8 oz.	(5 lbs 11.8 oz) or 5 lbs 12 oz

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Handout #2-4

GUIDE FOR ROUNDING-OFF WEIGHTS AND MEASURES

WEIGHTS

If the TOTAL amount of an ingredient is:	Round it to
Less than 2 oz................	Change to measure unless weight is in ¼, ½ or ¾ oz. amount.
2 oz. to 10 oz................	Closest ¼ oz. or convert to measure.
More than 10 oz. but less than 2 lb 8 oz..............	Closest ½ oz.
2 lb 8 oz. to 5 lb..........	Closest full oz.
More than 5 lb..............	Closest ¼ lb

MEASURES

Less than 1 Tbsp............	Closest $\frac{1}{8}$ tsp
More than 1 Tbsp but less than 3 Tbsp...............	Closest ¼ tsp
3 Tbsp to ½ cup.............	Closest ½ tsp or convert to weight.
More than 2 qt but less than 4 qt.................	Nearest ¼ cup
1 gal to 2 gal...............	Nearest full cup of ¼ qt
More than 2 gal but less than 10 gal...............	Nearest full qt
More than 10 gal but less than 20 gal...............	Closest ½ gal
Over 20 gal.................	Closest full gallon

80

Handout #2-5

RECIPE CONVERSION EXERCISE - THE FACTOR METHOD - 125 PORTIONS

INSTRUCTIONS

1. Using the chart on #2-5a of this handout as a reference, convert the numbers in the base recipe to decimals to make math calculations easier. Write these decimal conversions in Column II.
2. Complete Column III by:
   - A. dividing the new recipe amount desired (125 portions) by the known base recipe (50 portions) to get the factor: 125 ÷ 50 = 2.5
   - B. multiplying the factor of 2.5 times each ingredient written as a decimal in Column II.
3. In Column IV convert the decimal ingredients from Column III into terms cooks will understand, using the decimal conversion chart for reference. For example, if an ingredient converts to 3.6875 lbs after being multiplied by the factor, it should be written as 3 lbs 11 oz for a cook.

MACARONI SALAD Ingredients	Column I 50 portions Base Recipe	Column II Write these ingredients as decimal equivalents	Column III Desired Amount: 125 portions. Determine factor by dividing 125 by 50 to get a factor of 2.5. Multiply each ingredient in Column II by 2.5 as indicated below in Column III	Column IV Convert new ingredient amounts into terms a cook will understand.
Macaroni, raw	1½ lbs	lbs	2.5 X_____ = ______ lbs	
Water	2 gal 3 qt	gal	2.5 X_____ = ______ gal	

Handout #2-5

RECIPE CONVERSION EXERCISE (continued)

Ingredients	Column I	Column II	Column III	Column IV
Celery, diced	15 oz.	lbs	2.5X_____ = ______lbs	
Salad Dressing	1½ C	cups	2.5X_____ = ______cups	
Pimento, chopped	3 tsp	Tbsp	2.5X_____ = ______Tbsp	
White pepper	½ tsp	tsp	2.5X_____ = ______tsp	

Check answers individually with instructor or as a class together.

Handout #2-5a

DECIMAL CONVERSION CHART

DECIMAL UNIT	WEIGHT		MEASURE		
	A OZ.	B LBS	C CUPS	D QTS	E GALS
.03125	½		½		
.0625	1		1	¼	
.09375	1½		1½		
.125	2	1/8	2	½	
.15625	2½		2½		
.1875	3		3	3/4	
.21875	3½		3½		
.25	4	¼	4	1	¼
.28125	4½		4½		
.3125	5		5	1¼	
.34375	5½		5½		
.375	6	3/8	6	1½	
.40625	6½		6½		
.4375	7		7	1 3/4	
.46875	7½		7½		
.5	8	½	8	2	½
.53125	8½		8½		
.5625	9		9	2¼	
.59375	9½		9½		
.625	10	5/8	10	2½	
.65625	10½		10½		
.6875	11		11	2 3/4	
.71875	11½		11½		
.75	12	3/4	12	3	3/4
.78125	12½		12½		
.8125	13		13	3¼	
.84375	13½		13½		
.875	14	7/8	14	3½	
.90625	14½		14½	3½	
.9375	15		15	3 3/4	
.96875	15½		15½		
1.0	16 oz.	1 lb	16 cups	4 qts	1 gal

Handout #2-5b

RECIPE CONVERSION EXERCISE - THE FACTOR METHOD

ANSWER SHEET FOR INSTRUCTOR

INSTRUCTIONS

1. Using the chart on page 2 of this handout as a reference, convert the numbers in the base recipe to decimals to make math calculations easier. Write these decimal conversions in Column II.
2. Complete Column III by:
   A. dividing the new recipe amount desired (125 portions) by the known base recipe (50 portions) to get the factor: 125 ÷ 50 = 2.5
   B. multiplying the factor of 2.5 times each ingredient written as a decimal in Column II.
3. In Column IV, convert the decimal ingredients from Column III into terms that cooks will understand using the decimal conversion chart for reference. For example, if an ingredient converts to 3.6875 lbs after being multiplied by the factor, it should be written as 3 lbs 11 oz for a cook.

MACARONI SALAD	Column I 50 portions Base Recipe	Column II Write these ingredients as decimal equivalents	Column III Desired Amount: 125 Portions. Determine factor by dividing 125 by 50 to get a factor of 2.5. Multiply each ingredient in Column II by 2.5 as indicated below in Column III.	Column IV Convert new ingredient amounts into terms a cook will understand.
Macaroni, raw	1½ lbs	*1.5* lbs	2.5X *1.5* = *3.75* lbs.	*3 lbs 12 oz*
Water	2 gal 3 qt	*2.75* gal	2.5X *2.75* = *6.88* gal	*6 gal 3½ qt*

Handout #2-5b

RECIPE CONVERSION EXERCISE - THE FACTOR METHOD
(continued)

ANSWER SHEET FOR INSTRUCTOR

Ingredients	Column I	Column II	Column III	Column IV
Celery, diced	15 oz.	*.94 lbs*	2.5X *.94* = *2.34* lbs	*2 lb 5½ oz*
Salad dressing	1½ C	*1.5 cups*	2.5X *1.5* = *3.75* cups	*3 3/4 cups*
Pimento, chopped	3 tsp	*1 Tbsp*	2.5X *1* = *2.5* Tbsp	*2½ Tbsp*
White pepper	½ tsp	*.5 tsp*	2.5X *.5* = *1.25* tsp	*1¼ tsp*

Check answers individually with instructor or as a class together.

Handout #2-6

RECIPE CONVERSION ASSIGNMENT - THE FACTOR METHOD - - 375 PORTIONS

May be used as a class activity or as a homework assignment.

INSTRUCTIONS

1. Using the chart on Handout #2-5a as a reference, convert the numbers in the base recipe to decimals in Column II.
2. Complete Column III by calculating the factor required and converting all ingredients to their new amounts. Show all math work.
3. In Column IV, convert the decimal ingredients from Column III into terms that cooks will understand, using the decimal conversion chart for reference.

INGREDIENTS	COLUMN I 50 Portions Base recipe	COLUMN II Decimal Equivalents	COLUMN III Desired Amount: 375 Portions. Factor used:____________	COLUMN IV Ingredients as a cook understands them
Macaroni, raw	1 3/4 lbs	lbs	______________ lbs	
Water	2 gal 3½ qt	gal	______________ gal	
Celery, diced	13 oz	lbs	______________ lbs	
Salad Dressing	2 C	gal	______________ gal	
Pimento, chopped	1 T 1½ t	Tbsp	______________ Tbsp	
White Pepper	3/4 tsp	tsp	______________ tsp	

Check answers individually with instructor or as a class together.

Handout #2-6a

RECIPE CONVERSION ASSIGNMENT - THE FACTOR METHOD

ANSWER SHEET FOR INSTRUCTOR

May be used as a class activity or as a homework assignment.

INSTRUCTIONS

1. Using the chart on Handout #2-5a as a reference, convert the numbers in the base recipe to decimals in Column II.
2. Complete Column III by calculating the factor required and converting all ingredients to their new amounts. Show all math work.
3. In Column IV, convert the decimal ingredients from Column III into terms that cooks will understand, using the decimal conversion chart for reference.

INGREDIENTS	COLUMN I 50 portions Base recipe	COLUMN II Decimal Equivalents	COLUMN III Desired Amount: 375 Portions. Factor Used: *7.5*	COLUMN IV Ingredients as a cook understands them
Macaroni, raw	1 3/4 lbs	*1.75* lbs	*13.13* lbs	*13 lb 2 oz*
Water	2 gal 3½ qt	*2.88* gal	*21.56* gal	*21 gal 2¼ qt*
Celery, diced	13 oz	*.812* lbs	*6.09* lbs	*6 lb 1½ oz*
Salad dressing	2 cups	*.12* gal	*.94* gal	*15 C or* *3 3/4 qt*
Pimento, chopped	1 T 1½ t	*1.5* Tbsp	*11.25* Tbsp	*Scant 3/4 C*
White pepper	3/4 tsp	*.75* tsp	*5.63* tsp	*1 T 2½ t*

Check answers individually with instructor or as a class together.

LESSON 3 : WORK SIMPLIFICATION

A. GOALS OF THIS LESSON

The goal of this lesson is to understand general principles of work simplification, a method of increasing foodservice efficiency.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. Challenge the present method of performance and plan the operation to save time, energy and money;
2. Understand the need for cooperation and coordination of all segments of the foodservice;
3. Know the steps in breaking down and analyzing a specific job;
4. Know how to use a flow process chart.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate handouts needed for classes.
2. Obtain food and equipment for demonstration.

LESSON 3 : WORK SIMPLIFICATION

D. KEY WORDS USED IN THIS LESSON

WORK SIMPLIFICATION: The process of making a job easier.

MOTION ECONOMY: Using the fewest number of motions to complete the task with ease.

E. REFERENCES FOR ADDITIONAL INFORMATION

Kazarian, E. A. Work Analysis and Design for Hotels, Restaurants and Institutions, 1979, AVI Publishing Co., Westport, CT ($19.50).

Van Egmond-Pannell, D. School Food Service, 1981 (See Lesson One).

West, B., Wood, L., Hargar, V., and Shugart, G. Food Service in Institutions, (See Lesson One).

LESSON 3 : WORK SIMPLIFICATION

LESSON CONTENT

CLASS ACTIVITY

I. INTRODUCTION TO WORK SIMPLIFICATION

A. Work Simplification:

1. Is the process of doing a job easier for everyone.
2. Eliminates the unnecessary parts of a job which add nothing to the value of the product.

B. Advantages of Work Simplification:

1. It allows school food service personnel to work smarter, not harder;
2. It fosters creative thinking and increases job satisfaction;
3. It improves the quality of the school food service program;
4. It increases productivity;
5. It should save money.

LESSON CONTENT	CLASS ACTIVITY

C. Disadvantages of Work Simplification:

1. It requires all personnel to examine operational procedures with detailed care;
2. It implies that work must be done exactly the same way each time.

D. Work Simplification Is Important To:

1. Increase productivity; food service typically has 40-45% productivity rates;
2. Reduce operational costs;
3. Provide employee with job satisfaction;
4. Create and maintain a quality food service program.

II. STEPS NECESSARY FOR A WORK SIMPLIFICATION PROGRAM TO BE EFFECTIVE

A. Positive Employee Attitude and Desire to Improve Performance are Needed. Employees Must:

1. Make a conscious effort to find an easier and quicker way to do an operation;

LESSON CONTENT	CLASS ACTIVITY
2. Be willing to change habits and work arrangements.	
B. Management Must Be Willing To:	
1. Review and consider and perhaps purchase equipment;	
2. Know availability of food and materials;	
3. Complete short and long term planning.	
C. Encourage Employee Input in Training Program Needs and Operational Procedures.	
D. To Improve or Change a Method of Food Preparation, It Must Be:	
1. Approached with the Idea It Can Be Improved.	
2. Remembered that an Open Mind Plus Persistence Equals Results.	
III. MOTION ECONOMY	Use Handout #3-1, Smooth-flowing motions. The use of hand and arm in a
A. Principles of Motion Economy Can Be Divided Into Three Areas:	

LESSON 3 : WORK SIMPLIFICATION

LESSON CONTENT

1. Hand and Body Motion:

   a. avoid unnecessary reaching, stretching and bending;

   b. use both hands, starting and completing motions at the same time;

   c. use an overlapping figure eight stroke or a circular motion that requires less employee energy than stilted "back and forth" strokes.

   d. perform with a rhythmic movement

      (1) Cutting with a French knife:

      The point of French knife should remain on the board and with left hand, move the vegetable under the knife, rocking the blade up and down, cutting in a definite rhythm.

      (2) Other kitchen activities that develop a natural rhythm are stirring, panning biscuits, cookies, and racking dishes.

CLASS ACTIVITY

smooth-flowing motion is faster and less tiring. This applies to washing tables or spreading sandwich filling. As a class, discuss what kitchen activities use these motions. Practice the motions.

Demonstrate the rhythym and ease in using a French knife by cutting a bunch of celery.

LESSON 3 : WORK SIMPLIFICATION

LESSON CONTENT	CLASS ACTIVITY
(3) Curved Motions increase productivity over straight line motions. Examples to observe include mopping the floors, wiping tables.	
2. Motions required to perform a task within a specific working area and the number of steps required to assemble needed materials.	Use Handout #3-2, Identification of normal area. After the participants review and discuss the handout, each participant should measure table and chair heights in their own kitchens and report to the group at a later date.
3. Equipment or tools and design of work area supplies, activities, and work area should be considered as a unit for efficient operation to saving time and energy. a. Whenever possible all materials and tools should be located within a normal grasp area--about 21 inches. b. Plan for the location of items in the work area to permit the best assembly or sequence of motion. c. Plan for delivery of materials to the point of use by tray, cart, or truck.	

LESSON CONTENT

d. Plan for the proper amount and height of the work place:

   (1) allow approximately 4 linear feet of work space for each preparation employee;

   (2) allow width of table for worker on one side to be 24 to 30 inches;

   (3) allow width of table for worker on two sides to be 3½-4 feet;

   (4) allow general working height for standing at 3 feet;

   (5) allow general working height for sitting at 24-30 inches.

IV. ENVIRONMENTAL CONDITIONS THAT PROMOTE PLEASANT WORKING AND EFFICIENT PRODUCTIVITY.

A. Good Lighting for Good Vision.

B. Temperature for Food Preparation and Service Areas Maintained at 68°-75°F with a Relative Humidity of 50-60 percent.

CLASS ACTIVITY

Provide a discussion period for class participants to react to environmental conditions in their kitchens. What changes have been made? If money were not a

LESSON CONTENT	CLASS ACTIVITY
C. Noise Levels Controlled Using Sound-Absorbing Ceilings, Smooth Running Motors and Mobile Equipment with Neoprene Wheels. D. Resilient Floors are Less Tiring than Hard Floors and Should Be Used When People Are Standing For Extended Periods.	problem, what could they suggest to improve the environment?
V. SPECIFIC WORK SIMPLIFICATION TECHNIQUES A. Provide and Use Labor-Saving Equipment Such as Slicers, Food Choppers and Mixers. B. Store Shared Equipment and Tools at the Location of First Use. C. Place Condiments, Flour and Baking Powder Near Weighing Scale Center Where Used. D. Reduce Work Delays By: 1. maintaining equipment; 2. keeping knives sharp; 3. putting equipment away clean and in proper location;	Use Handout #3-3, Labor-saving equipment. Call attention to the use of labor-saving equipment which saves time and energy. If equipment is not in the kitchen at this time, it could provide a reminder for short and long term planning. Ask class participants to time activities they do in their own kitchens and report at next class period.

LESSON 3 : WORK SIMPLIFICATION

LESSON CONTENT	CLASS ACTIVITY
4. following the production sheet and work schedule; 5. using the right tool for the job.	
VI. APPLICATION OF WORK SIMPLIFICATION PRINCIPLES A. Management Must Apply Work Simplification Principles in: 1. the use of cycle menues; 2. standard recipes; 3. use of work schedules for equipment and personnel. B. Identify Technical Practices That Will Increase Efficiency and Avoid Errors in the Following Areas: 1. range; 2. salad and vegetables; 3. serving lines; 4. dishwashing, pot and pan washing, miscellaneous cleaning and maintenance.	Use Handout #3-4, Work Simplification Practices for Specific Areas. Identify specific work simplification practices that can be used in a discussion session. The group can be divided into the four areas to discuss and collectively add to the material on the prepared sheet.

LESSON 3 : WORK SIMPLIFICATION

LESSON CONTENT

CLASS ACTIVITY

C. Questions For Everyone To Ask Him/Herself:

1. Am I too busy to be efficient?
2. Do I ever mistake activity for accomplishment?

VII. BASIC PROCEDURES FOR A WORK SIMPLIFICATION PROGRAM

A. Five Basic Steps Followed in Work Simplification:

1. Select a specific job for improvement.
2. Break the job into its elements or detailed steps (analysis).
    a. Make ready: assembling equipment, preparation of food, utensils needed to work.
    b. Performance: doing the job.
    c. Put Away: cleaning up and putting away tools and utensils.
3. Question each detail.
4. Devise an improved method (synthesis).

5. Place the improved method in operation.

B. Questions That Should Be Asked Whenever an Activity or Preparation Procedure Is Being Studied:

1. Why: what is the reason for the activity.
2. What: describe the activity.
3. Where: is this the best location for the activity.
4. When: is this the proper sequence of events.
5. Who: is this the person who should be performing the activity.
6. How: is this the best method.

C. The Improved Method Devised:

1. eliminates unnecessary detail;
2. combines details when practical;
3. changes sequence; rearrange for better sequence;

LESSON 3 : WORK SIMPLIFICATION

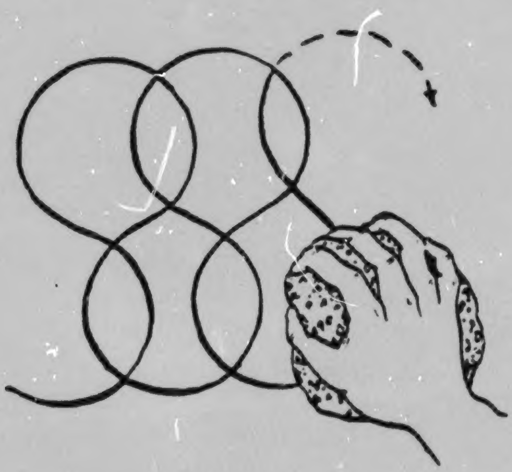
LESSON CONTENT	CLASS ACTIVITY
4. simplifies or improves all necessary details.	
VIII. **PROCESS FLOW CHART** A. Identifies the Movement of Materials and People. B. Uses Standardized Management Symbols for Movement, Hold, Delay, and Operation Assets in the Recording of Events.	Use Handout #3-5, Preparing Cabbage Slaw. After review and discussion of cabbage slaw operation, give each participant or group of participants a Flow Process Chart (Handout #3-6) and provide class time or an assignment for next class to work out a problem of their own selection.
IX. **WORK SIMPLIFICATION IS AN ONGOING ACTIVITY** A. Improvement is always possible. B. As operational procedures change, methods of operation must be reexamined and evaluated. C. The task of work simplification is never completed.	Use Handout #3-7, Flow Chart. This chart is used to determine efficiency of using both hands in an operation. Use Handout #3-8, Flow Chart. The result of one person's ability to pour juice using both hands. Count the

LESSON CONTENT	CLASS ACTIVITY
	number of steps used with right hand and the number of steps used with the left hand.

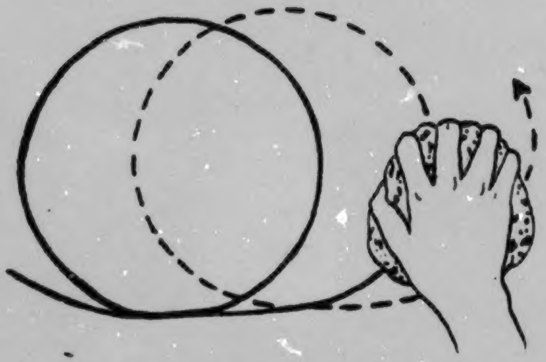
Handout #3-1

MAKE RHYTHMIC AND SMOOTH-FLOWING MOTIONS

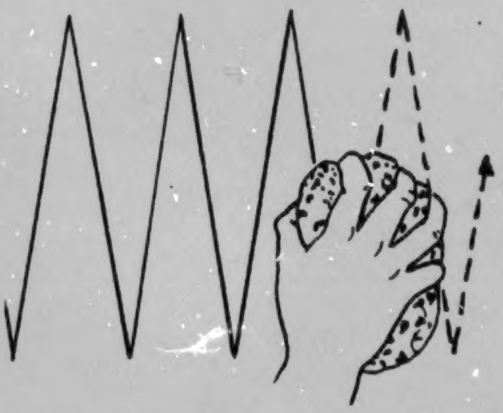
Smooth, curved motions make use of the momentum of the arm.



An overlapping figure-eight stroke



and a circular motion requires less energy than short back and forth strokes.



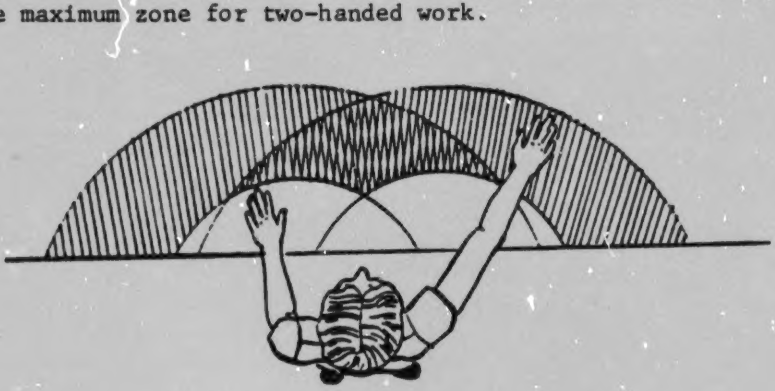
Adapted from: Ross, L. Work Simplification in Food Service. 1972, Ames, Iowa, Iowa State University.

Handout #3-2

LOCATE ACTIVITY IN NORMAL WORK AREAS WHEN POSSIBLE

Since most work involves the use of both hands, the total normal work area includes that space covered by the combined arcs of the two forearms. To find your normal work area, pivot first the right hand, then the left hand at the elbow and scribe an arc on the work surface. The area where the two arcs overlap is the normal work area for two-handed tasks.

The space on the work surface within which work is done with an average amount of energy is called the maximum horizontal work area. To find this area (see shaded portion below), make an arc over the work surface by extending first the right arm and then the left arm easily outward and swinging from the shoulder. The area formed by the overlapping arcs constitutes the maximum zone for two-handed work.



Adapted from: Ross, L. Work Simplification in Food Service. 1972, Ames, Iowa, Iowa State University Press.

Handout #3-3

LABOR-SAVING EQUIPMENT

Labor-saving equipment can process foods more efficiently and satisfactorily. The following chart shows how it may be used in the different food production areas to process a variety of foods for those specific work centers. When a piece of equipment can be used, the amount of labor can be reduced. Also, time-consuming hand operations, such as carrot sticks or dicing, can be done quickly with the right equipment.

EQUIPMENT	COOK'S AREA	SALAD AREA	BAKERY AREA
Food Chopper	Onions Carrots and Celery for Meat Loaves or Meat Balls Egg Salad Sandwiches Meat Salad Sandwiches Bread Crumbs Crackers	Cole Slaw Cranberries Carrots Pickles Celery Apples	Nutmeats Dry Fruits Sweet Crumbs Graham Cracker Crumbs
Slicing Machine Hand/Mechanical	Meats Cold Cuts Roasts Ham Turkey Cheese	Onion Slices Carrot Curls or Sticks Tomatoes Fresh Pineapple Oranges	Bread

Handout #3-3/Page 2

EQUIPMENT	COOK'S AREA	SALAD AREA	BAKERY AREA
FRENCH FRY CUTTER	French Fried Potatoes	Carrot Sticks Apples for Waldorf Salad	
VEGETABLE CUTTER	Green Peppers Onions French Fries Boneless Meats	Slaws Radishes Apples Eggs	
SECTIONAL STEAMER	Meats Potatoes Wieners Brown Bread Rice, Macaroni, Noodles Eggs Carrots Frozen Vegetables	Hard Cooked Eggs	Steamed Puddings Starch-based Puddings or Thickening Agents
DEEPFAT FRYER	Seafood Cutlets Fritters French Fried Potatoes Swedish Meat Balls Onion Rings Apple Rings in Batter Wieners in Batter		Doughnuts Fried Cakes Fried Pies

EQUIPMENT	COOK'S AREA	SALAD AREA	BAKERY AREA
STEAM-JACKETED KETTLE	Soups Vegetables Cream Sauce Macaroni Spaghetti Cereal Cocoa Harvard Beets Rice Pot Roast Casserole	Vegetables for Cooked Vegetable Salad	Cornstarch-Base Puddings and Pie Fillings
MIXER WITH PADDLE	Biscuit Topping Pancake Batter Brown Bread	Cheese Spreads Cream Cheese	Butter Cakes Cookies Quick Breads
MIXER WITH WHIP	Scrambled Eggs Omelets Flour Thickening Roux Gravy	Blended Fruit Juice French Dressing Mayonnaise Dry Milk	Sponge Cake Meringue Whipped Cream Whipped Puddings
MIXER WITH WING WHIP	Mashed Potatoes Rutabagas		Pastries

EQUIPMENT	COOK'S AREA	SALAD AREA	BAKERY AREA
MIXER WITH DOUGH HOOK	Meat Mixers		All Yeast Products
MIXER WITH GRINDING ATTACHMENT	Meats for Sandwich Fillings Cheddar Cheese Raw Fruits	Jellies Cranberries	Applesauce
MIXER WITH SLICING ATTACHMENT	Escalloped Potatoes Carrot Coins	Cabbage, Shredded	

Handout #3-4

WORK SIMPLIFICATION PRACTICES FOR SPECIFIC AREAS

WORK SIMPLIFICATION PRACTICES IMPORTANT IN THE RANGE AREA INCLUDE:

1. Weigh instead of measure whenever possible.

2. Weigh all dry ingredients first, then fats, then measure liquid (to avoid washing pan).

3. Use correct measuring equipment to eliminate motions. For example:

   Measure ¼ C instead of 4 Tablespoons
   Measure 1 qt instead of 4 C.

4. Keep a mix of flour and fat in the refrigerator (roux) convenient when making white sauce.

5. Use a wire whip for mixing flour and water for gravies.

6. Put a little oil (2 Tablespoons per 5 gal) on top of water to prevent starchy foods from boiling over if cooking on top of the range.

7. Grind several foods in succession when possible to save time, include some dry bread to clean the machine.

8. Make croquette mixture a day ahead and chill; this eases the work load and makes a quality product.

9. Hamburger patties may be made in quantities in several ways:

   a. Spread hamburger meat evenly over entire surface of 18" x 26" baking sheet, cover with wax paper and flatten with rolling pin. Cut into square hamburgers.

   b. Portion ground beef with scoop on an 18" x 24" cover with wax paper and place a second pan on top; push gently to flatten. Ready to start second pan.

c. Patties may be flattened with a bottom on a can dipped in cold water (use both hands, a can in each).

d. Purchase ready-to-cook hamburgers.

10. Scale meatloaf mixture into a greased loaf pan; cut into portions before baking; slices separate easily when cooked.

WORK SIMPLIFICATION PRINCIPLES IMPORTANT IN THE SALAD AND VEGETABLE AREA

1. Use vegetable brushes for cleaning vegetables.

2. Use correct knives for peeling and dicing and make use of boards.

3. Peel onions under water or cut in quarters and slip skins off.

4. Cut large stems from spinach or broccoli to save cooking time. Can be cooked separately.

5. Use wedges or whole vegetables when practical. Prepare frozen vegetables from the frozen state.

6. Use assembly line system for salad assembly. Make use of both hands.

7. Peel and section grapefruit and oranges over a bowl to save juice.

8. Drain all canned fruits and vegetables well to prevent leaking.

9. Make use of carts and dollies for ingredients and finished salad.

WORK SIMPLIFICATION PRINCIPLES IN THE PASTRY AREA

1. Weigh rather than measure.

2. Collect all ingredients needed before starting.

3. Sift flour directly into measure.

4. Roll sticky foods in powdered sugar before chopping.

5. Thicken juice of berries or other fruit before adding filling to pies.

6. Weigh or measure batter into pans to assure even volume.

7. Frost cakes on sides first and finish on top.

8. Dip knife into hot water when cutting pies or cakes.

9. Cut and frost cakes on a tray or brown paper to facilitate cleaning up.

10. Avoid extra handling of doughs or batters when practical:

    --drop cookies rather than roll.
    --ice box cookies.

11. Make up pastry crumbs (fat and flour) and keep on hand.

12. Portion by weighing pastry for pies and roll all crusts at one time. Stack by placing wax paper between each crust. These may be kept overnight in the refrigerator.

13. Compare cost of made from "scratch" or frozen shells.

14. Raisins coated with melted shortening will go through food chopper without sticking.

15. Use markers to obtain even cuts of pies and cakes.

16. Roll out and bake cobbler crust on a cookie sheet and then cut into squares. Place on warm fruit which has been cooked, thickened and portioned.

17. Prepare a pan-coating of 1 part flour, 1 part vegetable oil, and 1 part shortening creamed together to grease cake pans. Apply with a 3" brush.

18. Biscuits or rolled doughs may be rolled out on bun pans and then cut into diamond-shaped squares, using a knife instead of a biscuit cutter.

19. Use master mixer when practical.

20. Keep a mixture of sugar and cinnamon on hand.

21. Use thermometers and thermostats.

22. Use carts, racks and trays for transporting supplies and finished products.

WORK SIMPLIFICATION PRINCIPLES IN THE SERVING AREA

1. Collect all needed serving utensils and check to be sure the portion needs are met.

2. Standard ladles and spoons eliminate serving guesswork and save time if properly used.

3. Whenever possible, keep 2 pans of each food on the counter or warmer. This will prevent delays in serving.

4. Cook food whenever possible in serving pans. The food will stay warm longer and time will be saved in dishes and labor.

5. Arrange counter for efficient serving and easy for customer to pick up.

6. Do not dish plates too far ahead of time as food quickly cools.

7. Plates that are neatly and attractively served with well-drained vegetables, well-placed food items, create an atmosphere of appreciation of food and customer.

8. Serve food with a smile; looking at the customer creates an atmosphere of "caring" and respect for good food being served.

WORK SIMPLIFICATION PRINCIPLES IMPORTANT IN DISHWASHING-PAN WASHING-MISCELLANEOUS CLEANING AND MAINTENANCE.

1. Soak dishes containing starch, sugar and eggs in cold water. Soak greasy ones in hot soapy water. This saves time in cleaning and saves changing dishwater as often.
2. Scalloped potatoes and macaroni and cheese pans placed in the steamer for a few minutes will make washing easier.
3. Washing small equipment and knives when finished with using them is a good safety measure and protection for the equipment.
4. Never allow knives to soak in dishwashing compartment.
5. A mop pail on wheels with wringer element, eliminates tugging at heavy pails of water.
6. A broad push broom—not a straw broom—cleans a larger area.
7. Mop should be kept clean and sweet-smelling at all times.
8. Maximum efficiency is obtained when the specific instructions on the different brands of detergents or cleaners are followed. Read the labels before using any product.
9. Lemon juice used full strength or diluted in warm water is excellent for cleaning stainless steel.
10. The end of an apron or a wet towel is not a substitute for clean, dry pot holders.

11. Towels are not for wiping faces or wiping floors. Small clean cloths or towels should be available on the serving line for wiping spills on plates.

12. Operational procedures are everyone's concern; when lifting or carrying a heavy load, ask for help; use carts whenever possible.

13. Food items stored in the refrigerator or freezer should be well wrapped and labeled. If possible, label for future use, for example:

    Spaghetti sauce--9/10/82
    Use for Pizza--9/14/82

14. Freezing containers may be plastic bags, freezer wrap, or pint, quart or gallon containers. Cottage cheese cartons are not acceptable freezer containers.

15. Spills in the food service area are responsible for the greatest number of damaging accidents. Glass, spills and food on the floor should be cleaned up immediately to prevent accidents. Paper towels, dust pan, and mop are used for liquid and food spills, while glass should be picked up with broom and dust pan; glass "bits" can be picked up with a damp cloth.

QUESTIONS TO ASK YOURSELF

1. Am I too busy to be efficient?

2. Do I ever mistake activity for accomplishment?

3. Am I managing my job or is my job managing me?

Handout #3-5

FLOW PROCESS CHART

JOB: MAKING SLAW (present method)

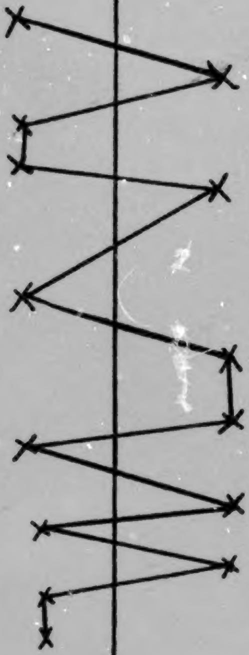
DATE: 6-15-81

RECORDED BY: ______________

OPERATION	TRANSPORTATION	INSPECTION	STORAGE OR DELAY	OPERATION OR STEP	REMARKS
X				1. Get recipe.	
		X		2. Look it over.	
X				3. Pick up tray.	
	X			4. Go to walk-in for cabbage.	
X				5. Get tray of cabbage.	
	X			6. Take to veg sink in kitchen.	
X				7. Clean.	
	X			8. Take back to salad table.	
X				9. Quarter.	
	X			10. Take to shredder.	
X				11. Shred cabbage.	
	X			12. Take back to salad table.	
X				13. Place on end of table.	
		X		14. Check recipe to see type of dressing used.	
	X			15. Go to walk-in for dressing.	

OPERATION	TRANSPORTATION	INSPECTION	STORAGE OR DELAY	OPERATION OR STEP	REMARKS
X				16. Get dressing.	
	X			17. Take dressing to salad table.	
	X			18. Go to kitchen to find a spoon for mixing.	
X				19. Find spoon.	
	X			20. Return to salad table.	
X				21. Mix.	
	X			22. Go to main kitchen to find spoon to taste.	
X				23. Get spoon.	
	X			24. Return to kitchen.	
X				25. Taste.	
	X			26. Go to kitchen for seasoning.	

Handout #3-5/Page 3

OPERATION	TRANSPORTATION	INSPECTION	STORAGE OR DELAY	OPERATION OR STEPS	REMARKS
				27. Get seasoning. 28. Return to salad table. 29. Season. 30. Taste. 31. Go to dish cupboard in kitchen for dishes. 32. Count out dishes. 33. Take back to salad table. 34. Go to kitchen for serving equipment. 35. Find slotted spoon. 36. Return to salad preparation table. 37. Pick up each dish; put spoonful of salad in each. Place back on table.	

Handout #3-5/Page 4

OPERATION	TRANSPORTATION	INSPECTION	STORAGE OR DELAY	OPERATION OR STEPS	REMARKS
X				38. Assemble dishes on a tray when that number of dishes is completed.	
		X		39. Inspect.	
	X			40. Take tray of salads to storage refrigerator in main kitchen.	
		X		41. Store until serving time.	
X		X		42. Continue Steps 37, 38, 39, 40, and 41 until all salad is dished up.	

Handout #3-5/Page 5

OPERATION	TRANSPORTATION	INSPECTION	STORAGE OR DELAY	OPERATION OR STEPS	REMARKS
X X	X			Note: Depending upon size of recipe, these steps may be repeated numerous times and should be charted. 43. Clean up unit. 44. Return equipment borrowed to areas where kept.	

Handout #3-5a

FLOW PROCESS CHART

JOB: MAKING SL[illegible] (revised method)

DATE: ______

RECORDED BY: ____________

OPERATION	TRANSPORTATION	INSPECTION	STORAGE OR DELAY	OPERATION OR STEP	REMARKS
X				1. Get recipe.	
		X		2. Look it over, make list of supplies needed.	
	X			3. Place trays on truck, go to walk-in for cabbage.	
X				4. Put cabbage on trays and transfer to truck; get salad dressing.	
	X			5. Transport back to salad unit.	
X				6. Wash.	
X				7. Quarter.	
X				8. Shred.	

Handout #3-5a/Page 2

OPERATION	TRANSPORTATION	INSPECTION	STORAGE OR DELAY	OPERATION OR STEPS	REMARKS
X				9. Mix with salad dressing; required spoon in drawer of counter.	
X				10. Taste-spoon in drawer of unit.	
X				11. Add seasoning, located in upper cupboard.	
X				12. Taste.	
X				13. Arrange serving dishes from cupboard on trays.	
X				14. Using assembly method to dish up salad with portion server, stored in drawer of unit.	

OPERATION	TRANSPORTATION	INSPECTION	STORAGE OR DELAY	OPERATION OR STEPS	REMARKS
		X		15. Inspect.	
	X			16. Transfer by truck to storage refrigerator.	
			X	17. Store in refrigerator for service.	
X				18. Clean up unit.	

Handout #3-6

FLOW PROCESS CHART

METHOD:

1. Break down job.
2. Question
3. Develop new method.
4. Apply new method and evaluate

Operation - doing
Transportation - moving
Inspection - examine
Storage - holding

FLOW PROCESS CHART

OPERATION	TRANSPORTATION	INSPECTION	STORAGE	OPERATION OR STEPS	REMARKS
				1.	
				2.	
				3.	
				4.	
				5.	
				6.	
				7.	
				8.	

Prepared by Jean McFadden, Extension Specialist, Food Service Management, Dept. of Food Science and Human Nutrition, Michigan State University.

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FLOW PROCESS CHART

OPERATION	TRANSPORTATION	INSPECTION	STORAGE	OPERATION OR STEPS REMARKS
				9.
				10.
				11.
				12.
				13.
				14.
				15.
				16.
				17.
				18.
				19.
				20.
				21.
				22.

Handout #3-7

WHICH HAND?

Activity: ______________

____

It is considered more efficient to use both hands and to combine steps to reduce the number of activities. A plan of work may include alternate plans. Identify the use of right and left hand, and the number of steps required to do the operation.

Code:

Operation (doing)

Transportation (moving)

Inspection (examining)

Delay or storage (holding)

ACTIVITY	LEFT HAND	RIGHT HAND	ACTIVITY

Prepared by: Jean McFadden, Extension Specialist, Food Service Management, Dept. of Food Science and Human Nutrition, Michigan State University.

Handout #3-7/Page 2

ACTIVITY	LEFT HAND	RIGHT HAND	ACTIVITY

Handout #3-8

POURING 100 SERVINGS OF APPLE JUICE

Operation:

Transportation:

Inspection:

Delay or Storage:

	Activity	Left Hand	Right Hand
1.	Get cart		
2.	To dry storage		
3.	Select 5 cans of juice		
4.	Load on cart		
5.	To work area		
6.	Get 5 trays		
7.	To work area		
8.	Get glasses		
9.	To work area		
10.	Get can opener		
11.	To work area		

Handout #3-8/Page 2

POURING 100 SERVINGS OF APPLE JUICE

	Activity	Left Hand	Right Hand
12.	Open can		
13.	Put 20 glasses on first tray		
14.	Pour juice		
15.	Check glasses - filled ½ C		
16.	Move tray to cart		
17.	Repeat Steps 13-16 for second, third, fourth, fifth trays		

Handout #3-8a

POURING 100 SERVINGS OF APPLE JUICE

ANSWER SHEET

Operation: Transporation:

Inspection: Delay or Storage:

	Activity	Left Hand	Right Hand
1.	Get cart	O	O
2.	To dry storage		
3.	Select 5 cans of juice		
4.	Load on cart		
5.	To work area		
6.	Get 5 trays	O	O
7.	To work area		
8.	Get glasses	O	O
9.	To work area		
10.	Get can opener		

Handout #3-8/Page 2

POURING 100 SERVINGS OF APPLE JUICE

ANSWER SHEET

	Activity	Left Hand	Right Hand
11.	To work area		
12.	Open can	O	O
13.	Put 20 glasses on first tray	O	O
14.	Pour juice	O	O
15.	Check glasses--filled ½ C.		
16.	Move tray to cart		
17.	Repeat Steps 13-16 for second, third, fourth, fifth trays		

Prepared by: Jean McFadden, Extension Specialist, Food Service Management, Dept. of Food Science and Human Nutrition, Michigan State University.

LESSON 4 : PROGRESS TEST

A. GOAL OF THIS LESSON

The goal of this lesson is to review the most important aspects of the past three lessons, by administering the following Progress Test.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. summarize and review the important information presented in Lessons 1, 2 and 3;
2. emphasize the most important points presented in Lessons 1, 2 and 3;
3. identify subject areas in which participants desire or need further study and practice.

NOTE: The Progress Test should NOT scare or humiliate participants or be used as a device to keep them from continuing on with further lessons. There is no minimum score of success. This is an exercise or learning activity just as other lessons have been.

C. INSTRUCTOR PREPARATION FOR CLASS PROGRESS TEST

1. The time allowed for this lesson is approximately 25 minutes.
2. Duplicate sufficient copies of the Progress Test.
3. How the Progress Test should be given:
   A. Pass out copies of the Progress Test to each participant.

B. Provide pens or pencils to those who may not have brought their own.

C. Explain that the reason for this Progress Test is to review the important information presented in the past three lessons.

D. Briefly go through the test together to explain the different kinds of questions to be sure that all participants know what they need to do for each question.

E. Allow approximately 25 minutes for participants to complete the test.

F. Allow participants to keep their own tests while answers are discussed.

G. State aloud which answer(s) are correct for each question.

H. Discuss how to change false statements so that they read "true".

I. Lead a class discussion relating to reasons why other choices, if given, are incorrect. Ask participants to give examples of the application of each question to their school foodservice situation.

J. Allow any participants who desire to do so to retake the test on their own time.

K. Provide additional references on any topic to participants who desire further information.

PROGRESS TEST 4

Multiple Choice

Circle the correct answer(s) in the questions below.
There may be more than one correct answer.

1. Some common problems in the kitchen that prevent maximum efficiency include:
   a. food cooked too early
   b. menu items too complicated to prepare in the time available.
   c. not enough money to spend on food supplies
   d. work not organized

2. Basic food preparation for quantity food product includes:
   a. baking turkey dressing in a separate pan and not in the turkey
   b. changing the standardized recipe to make it "better"
   c. cooking vegetables in small batches
   d. thawing frozen products at room temperatures

3. A standardized recipe means:
   a. a USDA Government Printing recipe
   b. every time it is used, the product will be the same
   c. helps reduce food and labor expenses
   d. the students enjoy eating the product

4. Factors related to Quality Foods are:
   a. buy the right ingredients
   b. determine quality standard
   c. plan the work schedule so product is ready at serving
   d. prepare in small batches

5. Work simplification means evaluating the method of operation.
   a. it improves the quality of the program
   b. it means "worker smarter, not harder"
   c. it should increase productivity and save time and money
   d. all of the above.

PROGRESS TEST 4, Page 2

6. Equipment or tools that could increase productivity
   - a. hand peeler
   - b. pot holder
   - c. sandwich bag sealer
   - d. scale

7. The responsibility for planning work simplification activities belongs to:
   - a. district administrators
   - b. every employee
   - c. school lunch director
   - d. state department

8. Work simplification is a process that
   - a. is always considered a "change"
   - b. is an on-going activity
   - c. is never completed
   - d. only needs to be done once

Matching--Place the number in the blank space that best defines the statement. The numbers can be used more than once.

____buying convenience foods

____mixture of seasoning and oil

____same as baking

____cut in long thin strips

____mixture of fat and flour

____to brown surface by intense heat

____to heat just below the boiling point

____the number of servings from a given recipe

(1) conversion
(2) factor
(3) julienne
(4) marinade
(5) motion economy
(6) roux
(7) scald
(8) sear
(9) steam
(10) wire whip
(11) work simplification
(12) yield

____method for converting the size of a recipe

____changing amounts

____using both hands

____invisible vapor that supplies cooking energy

____adding dried milk powder to dry ingredients

____a series of wires that form a whip used to mix or stir

ANSWER SHEET

PROGRESS TEST 4

Multiple Choice

1. *a, b, c, d*
2. *a, b, c, d*
3. *a, b, c*
4. *b, c, d, a*
5. *d*
6. *a, b, d*
7. *b, c*
8. *b, c*

Matching--Place the number in the blank space that best defines the statement

11 buying convenience foods

4 mixture of seasoning and oil

None same as baking

3 cut in long thin strips

6 mixture of fat and flour

8 to brown surface by intense heat

7 to heat just below the boiling point

12 the number of servings from a given recipe

2 method for converting the size of a recipe

1 changing amounts

5 using both hands

9 invisible vapor that supplies cooking energy

11 adding dried milk powder to dry ingredients

10 a series of wires that form a whip used to mix or stir

(1) conversion
(2) factor
(3) julienne
(4) marinade
(5) motion economy
(6) roux
(7) scald
(8) sear
(9) steam
(10) wire whip
(11) work simplification
(12) yield

LESSON 5 : EQUIPMENT

A. GOALS OF THIS LESSON

The goal of this lesson is to develop an awareness of the wide variety and sizes of food preparation equipment available for use in the preparation, mixing and cooking of food.

B. PURPOSE OF THIS LESSON

After completion of this lesson, the participants should be able to:

1. be aware of available electric, gas and steam equipment that can be used in school food service for preparation, mixing and cooking;
2. know the basic principles of operation and the intended use of ranges, ovens, steamers, steam-jacketed kettles, tilting fry pans, trunnion kettles, deep-fat fryers, mixers, slicers, and cutters;
3. list the proper daily, weekly or monthly cleaning procedures for equipment listed above.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of handouts.
2. Contact local source for purchasing equipment and arrange for tour of store or visit to class.
3. At least 10 weeks before showing, locate and arrange for film for this lesson.
    a. "Care and Cleaning of Kitchen Equipment," No. 2-165, State Library of Michigan

LESSON 5 : EQUIPMENT

D. KEY WORDS USED IN THIS LESSON

CUSTOM-MADE EQUIPMENT: made according to the customer's specifications

STANDARD EQUIPMENT: produced in quantity by a standard design

E. REFERENCES FOR ADDITIONAL INFORMATION

Avery, A., "The use and abuse of equipment," February 1973, Food Management, pp. 64-67. (See Appendix 2)

Davis, M., Beaver, F., Stephaus, S. School Food Service: A Course of Study for Local School Food Service Personnel. School of Home Economics, University of North Carolina, Greensboro, North Carolina 27416, ($8.00).

Jernigan, A., Ross, L., Food Service Equipment. Iowa State University Press, Ames, Iowa, 1974.

Scriven, C., Stevens, J., Food Equipment Facts, Conceptual Design, 9 Glenmore Rd. Troy, New York 12180, ($15.00), 1980.

U.S.D.A. Program and 1091 Equipment Guide for On-Site School Kitchen, 1974.

West, B., Word, L., Hargar, V., Schugart, G. Food Service in Institutions, John Wiley and Sons, Inc., 1977.

Wilkinson, J. The Complete Book of Cooking Equipment, Revised Edition. Cahners Books, CBI Publishing Inc., Boston, MA, 1975.

LESSON 5 : EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY

I. INTRODUCTION

A. Large Equipment Is Usually Defined as the Pieces of Equipment Installed at the Time the Kitchen is Built.

1. They are considered building costs.

2. Many school food service operations identify large equipment as:

   a. anything costing over $300;

   b. requiring two or more signatures before purchase.

B. Factors Affecting the Selection of Equipment

1. Will it do the job?

2. What is the available source of energy for operation:

   a. electric

   b. gas

   c. steam

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LESSON CONTENT	CLASS ACTIVITY

3. Menu pattern
4. Available floor space
5. Budget, or how much money can be spent to purchase and operate equipment
6. Short and long-term goals of the food service affecting selection of equipment:
    a. number of people expected to serve
    b. cooking from convenience items or cooking from scratch
    c. the centralization of preparation in a base kitchen and transporting food to other schools and groups

C. Equipment Discussed in This Lesson Will Include:

1. Ranges
2. Ovens
    a. deck or stack
    b. convection
    c. rotary or revolving
    d. microwave

LESSON CONTENT	CLASS ACTIVITY

3. Steam equipment
    - a. Compartment steamer
    - b. Steam-jacketed kettle
    - c. Quick steamer
    - d. Trunnion tilt kettle
    - e. Tilting fry pan or braising pan

D. For Maximum Efficiency of Equipment the Manufacturer's Directions Should be Followed in Both the Operation and Cleaning of the Equipment.

1. Be sure to have a copy, if not the original, of the directions.

2. Be sure to have the warranty to the equipment.

II. RANGES

A. Are the General All-Purpose Equipment

1. All basic preparation methods can be performed: bake, braise, boil, grill, roast.

2. Model selection is determined by need and the amount of floor space.

LESSON CONTENT	CLASS ACTIVITY

B. Operational Procedures

1. Follow manufacturer's directions in the manual
2. Use stockpots and pans with flat bottoms to maximize the heating surface
3. For gas operated equipment, turn all burners on high until operating temperature is reached
4. Turn some rings down or off to save 80% in fuel.
5. Know your equipment:
    a. If you have hot spots, move your pans accordingly.
    b. Adjust the heat for hot spots.

C. Maintenance: Cleaning Procedures Include:

1. Keeping range top clean by wiping up spills and boilovers immediately.
2. Cleaning precautions include:
    a. Clean when cool

LESSON CONTENT	CLASS ACTIVITY
b. Do not pour water on top to cool or clean. c. Use a wire brush or scraper on solid or round units. d. Remove and scrub drip pans with warm detergent solution. III. OVENS A. Deck or Stack Ovens (2 or 3 decks high) 1. Operational procedure: a. Follow manufacturer's directions in the manual. b. Adjust for best results; ovens must be: (1) level; (2) Not overvented; (3) Used properly with the best pans available	

LESSON CONTENT	CLASS ACTIVITY
c. In a two-deck section oven, load the lower compartment that contains the thermostat first.	
d. Load each section evenly, spacing pans away from each other and the sides of of the oven.	
B. Convection Oven	
1. Operational procedures:	
a. Be certain there is circulation of air around the pans.	
b. Check handbook for cooking times and procedures.	
c. Do not turn blower "on" unless the doors are completely closed; turn blower to "off" before opening doors.	
2. Clearing procedures:	
a. Clean oven chamber surface daily with water and detergent solution.	
b. Remove heavier soil with a solution of half ammonia and half water.	

LESSON CONTENT	CLASS ACTIVITY

IV. STEAM EQUIPMENT

A. Steam Is an Exceptional Storer, Carrier and Deliverer of Heat.

1. Steam is produced by continuously boiling water.
2. There is six times as much heat in steam as in boiling water.

B. Steam Can Be Supplied From Various Sources:

1. A faraway source;
2. A central system;
3. A generator concealed in the base cabinet of a piece of equipment.

C. Compartment Steamer Which Operates with Five to Eight Pounds Pressure

LESSON 5 : EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY
D. Pressure or Quick Cooking Steamer: 1. operates at 15 pounds pressure; 2. has from one to three cooking compartments; 3. be certain to follow carefully manufacturers' directions for best results. 4. Each unit has a solenoid valve that lets cold escape as the steam enters the chamber. a. When the unit is hot, the valve will automatically close and allow the pressure to build up. b. If the solenoid valve is not functioning correctly, cold air will be trapped in the chamber and a longer time will be required for the steam. E. Cleaning Procedures For Steamers:	Use Handout 5-3 to discuss compartment steamer and tilting steam jacketed kettle.

LESSON CONTENT	CLASS ACTIVITY
1. After the steamer has cooled, wash inside and out with a brush dipped in water and mild detergent; rinse with clear water. 2. Leave door slightly opened so that gaskets will not stick to the compartment. F. Steam-Jacketed Kettle: 1. Are two stainless steel hemispheres or bowls, one sealed inside the other, with about two inches of space in between for steam. 2. Types of kettles: a. deep kettles (1) fully jacketed with steam all the way to the top (2) two-thirds jacketed with steam only part way	

LESSON CONTENT

CLASS ACTIVITY

- b. shallow kettles
  - (1) always full jacketed
  - (2) suitable for braising, browning meats, stews
- c. trunnion or tilting kettles
  - (1) mounted on trunnion with tilting durces
  - (2) has "pouring lip" for easy unloading

3. Cleaning procedures:

- a. If possible, turn steam off before draining the kettle. Food and liquid will not stick to the sides as the level goes down.
- b. If kettle cannot be cleaned immediately, fill with water.

LESSON CONTENT	CLASS ACTIVITY
c. Drain water; if washed immediately after use, add some water and pre-rinse.	
d. Scrub with a very fine metal sponge or brush.	
e. Close drain and pour hot soapy water into the container dish; machine detergent works fine.	
f. Scrub the inside of kettle thoroughly including the underside of the lids and hinges.	
g. Use the same water to scrub outside of the kettle.	
h. Open drain to remove soapy water and use bottle brush to clean drain pipe and valve.	
i. Close drain; fill kettle about one-third full of water. Heat it, rinse outside of kettle, and swish inside. Drain.	

LESSON 5 : EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY
j. Be sure kettle is thoroughly rinsed inside and out.	
V. MIXERS	
A. Labor-Saving Device to Mix Large Quantities Rapidly and Evenly.	Use Handout #5-4 for discussion or for touring a kitchen.
B. Safety Precautions:	
1. Select the right bowl and beater or whip; be sure to fasten bowl and beater in place.	
2. Do not put hand, fingers or spoons into the bowl while the mixer is running.	
3. Stop machine before scraping down the sides.	
4. Read operating manual to be sure you understand the speed you should use, 1 for low and 3 for high.	

LESSON CONTENT	CLASS ACTIVITY
5. Shift gears to higher speed with caution; contents could spill out or overmix.	
C. Cleaning reminders:	
1. Wash and rinse mixer attachments as soon as possible. The wire whip especially may get bumped and spokes weakened.	
2. Machine itself should also be washed with soap and water solution.	
VI. FOOD CHOPPER	
A. Definition	
1. Can be an attachment to the mixer or can be a separate piece of equipment that chops or dices	Handout #5-5 will serve as a discussion item as well as information. It could be used when going through a kitchen as part of a lesson or field trip.
2. Has a rotating bowl with two power-driven knives.	

LESSON CONTENT	CLASS ACTIVITY
B. Safety Precautions 1. Never put hands or fingers in the bowl when chopper is in use 2. Wait until knives have stopped revolving before removing food or cleaning. 3. Fill bowl only two-thirds full; do not overload. 4. Be careful that meat being chopped does not have any bone or gristle because they could do damage to the knives. VII. HIGH SPEED FOOD CUTTER (VCM) A. How to Operate: 1. Follow operating manual 2. Usually each ingredient is added one at a time	

LESSON CONTENT	CLASS ACTIVITY
B. Cleaning Should Be Done According to Operating Manual VIII. SLICERS A. Kinds Available and Their Use: 1. Completely hand-operated; used when volume is small, but a uniform product is desired. 2. Semi-automatic: a. the knife rotates mechanically by a motor while the carriage is pushed back and forth by hand b. can produce 50 to 70 slices per minute 3. Fully automatic; the electric power drives both carriage and knife a. speed can be specified from 30 to 50 strokes per minute	

   b. can be regulated from 1 to 55 slices per minute

B. Most Slicers Produce Slices from 10 Slices Per Inch To Slices ^{3}/4-inch Thick.

C. Operating Procedures:

1. Gravity fed with the carriage on an angle pointing down toward the knife.

2. A weighted plate pushes the food against the rotating blade.

3. Manufacturer's directions should be followed to give best results in slicing and to care for the machine properly.

4. Basic steps include:

   a. put plug in outlet

   b. place food in carriage; hold firmly in place by means of a food holder

   c. adjust blade control indicator for desired thickness of slice

LESSON CONTENT	CLASS ACTIVITY
d. start motor e. slice food 5. To assure long life of the machine, be sure never to: a. use slicer when blade guard is off; b. always pull the plug--*not* the cord--when disconnecting the machine; c. use a metal instrument to scrape off food particles from slicer knife; a nicked blade tears the food; d. use hot water or steam in cleaning slicer as too much heat may reduce the lubricants in important parts D. Cleaning Method: 1. Remove parts. 2. Clean blade by wiping guage plate with detergent, rinse and dry.	

LESSON CONTENT | CLASS ACTIVITY

3. Clean and replace guard in same manner as with blade.

4. Clean outer parts in same manner.

5. Clean frame area base.

6. Replace parts.

7. Clean area around the slicer.

IX. DEEP-FAT FRYERS

A. Definition:

1. Also called a fry kettle; has a single function--to cook foods submerged in hot fat.

2. Has a compartment in which fat is heated; wire baskets fit into the compartment and hold food in the hot fat until it is cooked.

B. Factors that need to be taken into consideration when selecting a fryer:

LESSON CONTENT	CLASS ACTIVITY
1. temperature and recovery rate of the fryer; 2. amount of food to be fried at one time; 3. temperature of the food to be fried (frozen, thawed, fresh); 4. size and shape of the pieces of food. C. Types of Fryers: Gas and Electric: 1. Conventional restaurant model: a. range in size from 11" x 11" to 24" x 24" b. free-standing or built-in 2. Pressure fryer: a. has a tight sealed lid permitting moisture given off in the cooking process b. builds up steam pressure within the kettle	

LESSON 5 : EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY
3. Semi-automatic: a. high production model turns out continuous portion batches via conveyer b. each batch discharged when cooked while another batch continues to cook c. this equipment might be for a centralized, very large operation 4. Automatic fryers that completely control the frying cycle from the time the operator pushes the time button which lowers the basket into fat until it returns to drain position after being cooked. 5. All fryers should fry about 1½ to 2 times their weight of fat per hour.	

LESSON CONTENT

Productive Capacities of Deep Fat Fryers

Fryer Fat Capacity

Fat in Fryer	10-15#	30-40#	45-60#
FOOD ITEMS			
F. fries $^1/8$" thck	21#	61#	90#
Fillet Fish	8-10 fillets	8.8#	17#
Croquettes	2#	8.8#	14.6#
Doughnuts 2½"	16	30	64

D. Fat for the Fryer

1. Select the right type of fat:

   a. animal and olive oil are unsuitable because of their distinct taste and smoke at low temperatures

   b. most vegetable oils are not stable enough

CLASS ACTIVITY

Place chart on board or use a transparency. This gives a rough idea of capacities.

The chart shows the amount of fat in different sized fryers, and then identifies the weight of certain foods (French fries, fish fillets, croquettes, and doughnuts) that can be cooked in the various fryers.

Contact local representative of fat and shortening manufacturer--for example, Proctor and Gamble or Durkee, to come to class and show employee training film on proper frying procedures.

LESSON CONTENT

CLASS ACTIVITY

c. vegetable oil--an oil product that has been especially processed to increase its stability; it is the best choice here. These fats are known as hydrogenated fats.

2. Checklist for characteristics to look for in selecting a fat include:

   a. good color

   b. neutral flavor

   c. low flavor transfer

   d. low absorption in foods fried in it

   e. good stability

   f. high smoke temperature

   g. resistance to rancidity

   h. resistance to gumming

LESSON CONTENT	CLASS ACTIVITY
E. Foods or Conditions That Cause Fat Breakdown: 1. Foods that contain large quantities of moisture, such as raw potatoes; 2. Sediment from flavor or crumbs; 3. Salt; 4. Foods with high copper content, such as oysters; 5. Operating fryer at a higher temperature than recommended by the manufacturer. F. Steps in Preparation and Frying: 1. Light or turn on fry kettle and set thermostat. 2. Bread, coat or dip items to be fried; be sure food is covered completely and has no loose crumbs; 3. Check temperature to see if it is correct:	

LESSON CONTENT	CLASS ACTIVITY
a. If too low, food will absorb too much fat.	
b. If too high, the food may be overbrowned on the outside and undercooked on the inside.	
4. Do not overload the fryer:	
a. fill baskets ½ to $^2/3$ full	
b. overloading will cool the fat, prolong cooking time, and produce greasy foods	
5. Fry until golden brown and lift from basket.	
6. Drain; drain again on absorbent material if necessary.	
7. Clarify fat:	
a. when fat should be filtered is determined in part by the frequency of use; if a fryer is used every day, it should be filtered daily and new fat added to replace the fat absorbed in foods.	

LESSON CONTENT	CLASS ACTIVITY
b. Factors that will result in a subjective decision about when fat is no longer usable include: (1) the color of the fried product; (2) appearance of fat--darkness of color; (3) eating qualities of the food; does the chicken taste like fish? (4) fat breakdown; (5) foam; (6) smoke emission. c. Methods of filtering fat: (1) In large volume operation, a filtering machine may be warranted	

LESSON CONTENT	CLASS ACTIVITY

(2) In small volume operations, straining equipment is enough, using either a wire strainer with a cloth, or a filter cone which is a stainless steel strainer with an absorbant cotton cone inside.

(3) For both types of straining equipment for small operations, the fat is syphoned from the fryer, or manually lifted and poured into the cone or the strainer cloth.

(4) More complicated filters use power pumps that force the fat through filters are available.

X. GRIDDLES--ELECTRIC

A. Quality Food Production Factors Include:

1. maintaining constant heat;

LESSON CONTENT | CLASS ACTIVITY

2. Large models are equipped with 2 to 8 separate thermostat controls so that different foods at different temperatures can be prepared simultaneously.

B. Clean New Griddles Before Use to Remove the Rust Preventative Substance Applied By the Manufacturer:

1. Wash entire surface and flanges with a non-flammable grease solvent.

2. Wash with warm water and mild detergent.

3. Rinse with damp cloth and wipe dry.

C. Operating Tips:

1. Load and cook food according to recipe on package directions.

2. Griddle surface must be grease-filmed before each cooking operation unless the food product contains adequate fat, such as sausage or bacon.

LESSON CONTENT	CLASS ACTIVITY
3. After each cooking load, scrape excess food and fat particles off the griddle surface with a flexible spatula or wire brush 4. Turn thermostat dials down to 200°F during idle periods; preheating takes only a few minutes. 5. Keep all surfaces around the griddle free of splashed grease. 6. Re-season the cooking surface after each cleaning. This includes: a. Preheat griddle to 400°F. b. Spread with light film of unsalted cooking oil or fat. c. After three minutes, wipe the grill clean and apply a second coating of oil. d. Set the thermostat to the desired temperature and start cooking.	

LESSON 5 : EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY
Many types of small equipment have not been discussed, but Handout #5-6 identifies various equipment and utensil terminology that could be helpful in discussion and general information.	
XI. PREVENTIVE MAINTENANCE	
To provide the best service from your equipment, care should be taken to follow manufacturer's directions.	Handout #5-7 is an example of one kind of equipment record. Class could discuss information they believe to be essential and re-design the form.
A. Clean After Each Use.	
B. Follow Special Cleaning and Maintenance Procedures.	
C. Keep an Equipment Record to Verify Service and Costs.	

HANDOUT 5-1

WORKING INFORMATION AND TYPES OF RANGES

Entree Preparation

pasta, rice, stews
soup

Vegetable Cooking

Grill Items

without grill, portable
one placed over burners.

Types

heavy-duty
  designed for large volume
  safe for heavy utensils

restaurant or cafe
  lighter in construction
  usually single units

Materials

external finish
  standard enamel or
  stainless steel

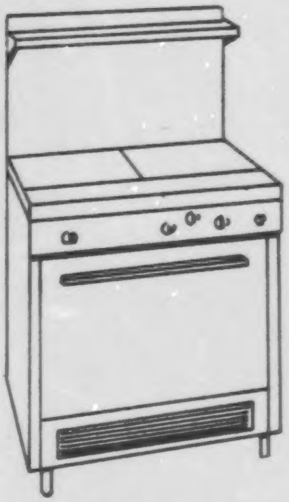
shelves
  enamel, chrome trim,
  or stainless

RANGES

Flat Top

Size: 30" x 31½"

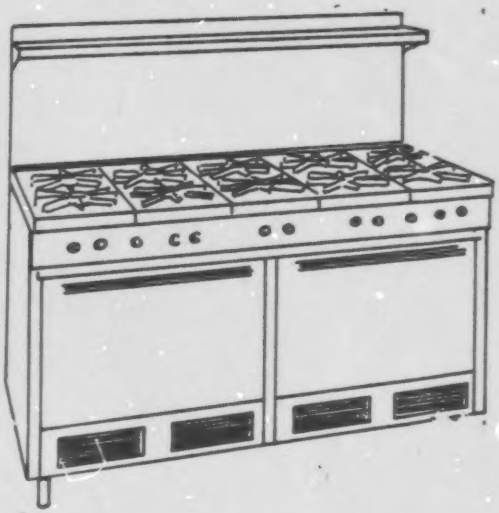
Oven: 26½" x 22"



Oven Burner

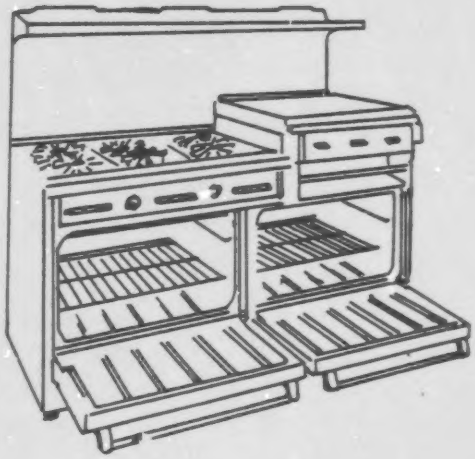
6-8-10 burners

Size:
48" x 60" wide
  36" deep



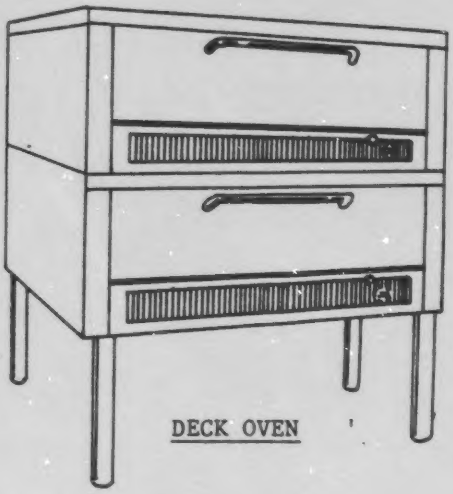
Fry Top

2-4-6 burners



HANDOUT 5-2

WORKING INFORMATION FOR DECK (STACK) AND CONVECTION OVENS


DECK OVEN

Deck(Stack) Oven - gas or electric

Baking deck 4" - 8" high

Roasting deck 11" - 15" high

Uses: bake, roast, reheat

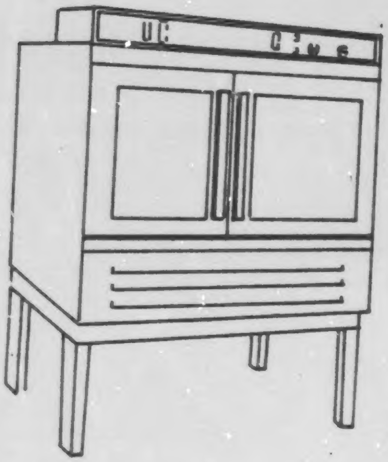
Convection - gas or electric

Ovens have blowers that constantly circulate air around the food, decreasing cooking time and temperature (25° below conventional)

Kinds
- single stack - 10 12x12x2½" pans
- double stack - 20 12x12x2½" pans
- roll-in - mobile range with different amounts

Types of doors
- single, double French, double Dutch

Uses
- bake, roast reconstitute, defrost, reheat


CONVECTION OVEN

HANDOUT 5-3

STEAM EQUIPMENT

Entree preparation

pasta products
chicken-turkey

Vegetable preparation

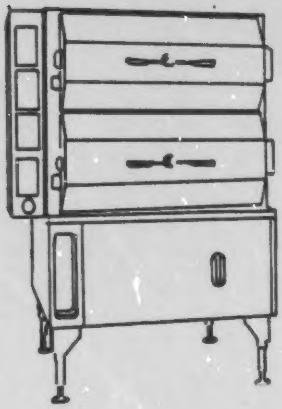
potatoes
vegetables

Materials

stainless steer
OR
aluminum

1-4 compartments

accommodate
2 - 12" x 20" pans



COMPARTMENT STEAMER

Vegetables

batch cooking

Sauces and Fillings

1 qt to 20 qt

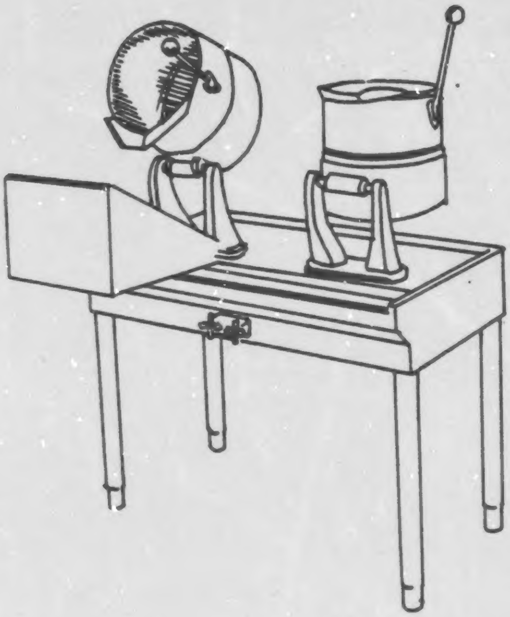
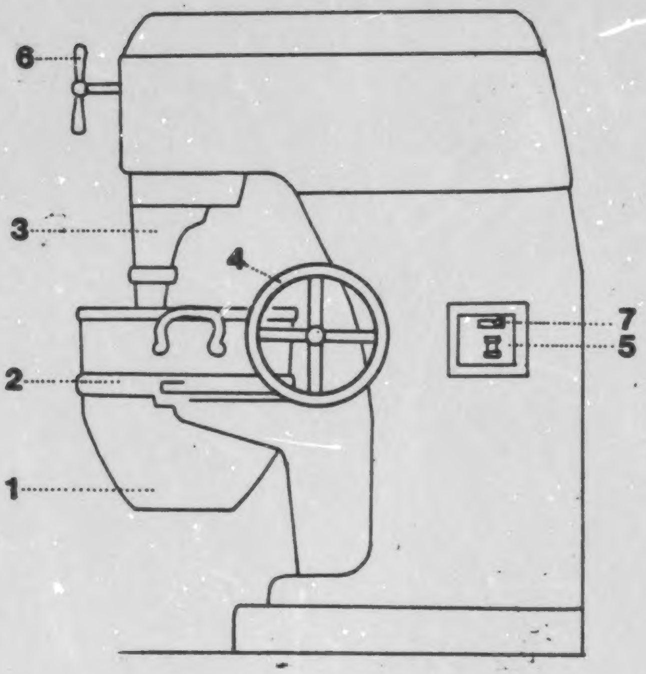


TABLE MODEL TILTING STEAM-JACKETED KETTLE

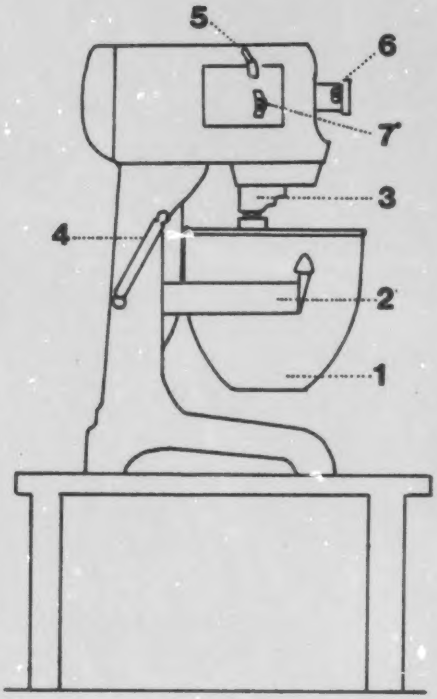
TRUNNION

HANDOUT 5-4 MIXER

IDENTIFYING THE PARTS AND KIND OF MIXER



FLOOR TYPE



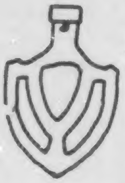
BENCH TYPE

The name of the parts are the same for either mixer.

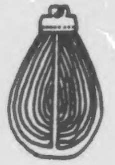
1. bowl
2. bowl support
3. beater shaft
4. lever to raise bowl
5. gear or speed control
6. attachment socket
7. "ON"/"OFF" switch

Attachments

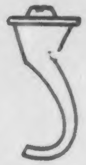
FLAT SHAPE



WIRE WHIP



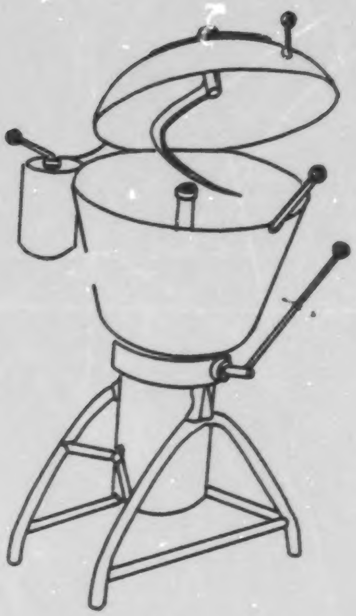
DOUGH HOOK



HANDOUT 5-5

SPEED FOOD CUTTER

High speed food cutter (VCM)



VERTICAL CUTTER MIXER

Capacity - 25 to 130 qts

Performance - the cutter will blend, whip, cream, grate and chop

Electric needs - operates at 3,500 rpm

Location - near sinks and water supply

EQUIPMENT AND UTENSIL TERMINOLOGY

HANDOUT #5-6 FOOD PREPARATION

Bain Marie - water bath built into counter for keeping food warm.

Braziers - heavy duty iron kettle that is fastened to the floor.

Large, round shallow walled pot with loop handles for lifting on and off stove. Very heavy to resist warping under high heat when used dry, as for searing meats. Used for searing, braising and stewing. Sizes graduate from 12 to 28 quarts.

Brushes & Scrapers

Block scraper - bristles of spring steel with chisel points, set in wooden blocks. Used to scrape wooden buther's surface after cutting meat. Never use water to scrub a block. Scrape well, remove scraping and cover with salt.

Coffee urn & gauge glass brushes - a must for keeping coffee urns clean and sanitary.

Pot hook - metal hook for lifting pots and pans from boiling sterilizing rinse water.

Pot and pan brushes - handled brushes for removing food residues from and for scraping pots and pans. Stiff bristles, usually of palmetto fiber. Sometimes called gong brushes.

Vegetable brushes - used to scrub root vegetables.

Buffalo chopper - chops ingredients mechanically; must be used with extreme care.

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China cap strainer and roller - a pointed, extra strong, perforated metal strainer. Has long handles and hook for hanging on side of pot. Used to strain sauces and semi-solids which can be forced through perforations with roller.

Choppers - an attachment for floor or table model mixer to chop vegetables, eggs, and cheese.

Colanders - perforated metal bowls with foot and loop handles. Used for draining salad greens, fruit and raw garnish or salad vegetables after washing. Several sizes.

Cook's table - a table either with wooden top or stainless steel used in the main preparation area.

Counter or Service Pans - shallow pans with wide rim designed to fit standard steam table openings, usually 12" x 20". Pans used for baking or steaming some foods in the same pan in which they are served or as a transfer pan from cooking utensil to hot storage. May be obtained perforated for steaming. Also available in 1/2, 1/3, 1/4 and 1/8 sizes for insertion in one opening through use of adaptors. Several depths, though standard is about 2-1/2". Sometimes called hotel pans.

Deck ovens - or stack ovens. May be two, three or four decks of ovens. Each oven approximately 4-1/2' x 3-1/4' and 10" high. Each oven has own temperature control.

Double boiler - consists of a lower section, similar to a stock pot, in which water is boiled, and the upper section for food which must be cooked at temperatures below that of boiling water. Sizes range from upper sections capacities of 4 to 40 quarts. Covers are provided for upper sections.

Dough cutter - wide rectangular blade with top mounted handle. Used for cutting or dividing rolled out or batch doughs, lifting dough from board and scraping dough board.

Food tongs - for handling food without touching with hands. Spring type metals, formed in elongated "U" shape, with sawtooth-like gripping fingers on each end.

French whip - bundle of wire loops with the ends firmly held together at the handle, some flexible, others stiff. Excellent for beating or whipping.

Grater - used for shredding cheese, cabbage or other vegetables that are needed in thin strip form.

Grills - electric or gas; cast iron with grease drip pan used for bacon, hamburgers, eggs, pancakes, grilled sandwiches, etc.

Hotel rack - a rack above the cook's table used for storage of ladles, spoons, sieves and pans.

Hot cake or meat turner - wide, offset, chisel blade used to slip under and support hot cakes, fried eggs, hamburgers while turning on griddle, broiler or oven sheet.

Knives

Boning - a short six inch blade; very thin, pointed blade knife used in separating raw meat from bone with minimum waste; also to filet fish. May have stiff or flexible blade.

Bread - blade sawtoothed or scalloped to slice bread without crumbling it.

Case - ordinary table knife, dull-edged blade used for spreading rather than cutting.

Chef's slicer - a short (12") pointed blade knife for slicing cooked meats, where point may be needed around the bones.

Cimeter or steak knife - a distinctly curved, pointed blade used in making accurate cuts, as cutting steaks from a loin.

Clam - flat blade with sharp edge for opening clams.

Cleaver - an extra wide, heavy blade, square-nosed knife. Used to chop through medium bone and heavy cartilage, such as the backbone structure of chops.

French - wide, functionally curved, pointed blade. Used for slicing, chopping and mincing food. Blade 6"-12" or longer in length. Most popular size for men is 12" blade; women 9" blade.

Fruit and salad - a short (6" blade) pointed knife for pantry use in preparation of salad greens, coring lettuce, paring and sectioning fruits.

Grapefruit - curved blades to cut close to the skin of the fruit.

Knives, cont.

Oyster - short blade with thin tapering rounded end.

Paring - a very short (2-1/2" - 3-1/2") pointed blade knife. Used for paring fruit and vegetables. Point used for eyeing and removing blemishes.

Pie and cake knife - wide bladed, offset knife with blade shaped as pie or cake wedges. Used to slip under individual pieces after cutting to remove from pan or stand without breaking.

Roast beef slicer - long (14") round nosed blade which will slice completely across the cooked roast beef.

Spatulas - wide, flexible, blunt blade knives for scraping utensils or spreading. Sizes range from 3-1/2" blade butter spreader to 12". Semiflexible blades are good for frosting spreaders while regular and highly flexible can be used for bowl knives. Also termed paletta knife. Also rubber with wooden handles used in food preparation area.

Utility - slender blades about 5" long (between paring knife and slicer in size).

Ladles - metal bowls or cups of known capacity attached to long handles with hooks at opposite end to prevent dipper from slipping into container. Used to measure liquids for service and portion control. Also to stir, mix and dip.

Measures - round, lipped, side handled measuring containers, accurately graduated usually in quarters. For accurate measurement of liquid and some dry ingredients. Available in gallons, half gallons, quart and pint sizes.

Mixer - may be either table or floor model (10,20,30, 40 quart). Used to combine ingredients, for creaming, or blending.

Ovens

Convection - fan built into the back of the oven which distributes the heat evenly so that 4 or more racks of food can be baked at one time.

Electronic - cook food in the matter of minutes with microwaves.

Pans

Bake - large, rectangular, shallow pans without covers. Used for baking. Various sizes; check oven size before ordering.

Pullman - narrow rectangular pans used for baking meat loaf or bread.

Sauce pan - smaller, shallower, lighter version of the sauce pot. Has a single, long handle for lifting. Some uses as sauce pot but for small quantities of food. Sizes range from 3" to 6" deep and from 1-1/2 qt. to 11-1/2 qt. capacity. Should have well-fitted cover.

Sauce pot - large, round medium deep pot with loop handles for lifting on and off the stove. Used for stove top cooking where the ratio of solid to liquid is higher and stirring or whipping is necessary.

Saute - large, round, shallow, straight walled pan with long handle for lifting (largest sizes also have one loop handle). Used for sauteing or cooking food in shallow fat. Heavy construction to withstand warping at high temperatures. Sizes range from about 2-1/2 - 4-1/2" deep and from about 10-12" inside diameter.

Sautoir - smaller, round, shallow pan with sloping sides, for the quick frying of foods in a minimum amount of fat. One long handle for lifting. Sizes range from 5-11" inside diameter.

Sheet - rectangular, very shallow (1") pans in various sizes. Used for baking sweet goods, oven frying and baking products.

Skillet - iron, heavy for pan-broiling or frying. Holds heat well.

Stockpot - large, round, high walled pot with loop handles for lifting on and off the stove. May be equipped with draw-off faucet or strainer. Well-fitting covers and inside racks to hold certain foods from the bottom should be available. Used for broiling and simmering. Sizes graduated from about 2-1/2 gallon to 40 gallon capacity.

Salamander - form of broiler used for broiling meats and fish.

Scoops (Ice cream dippers) - bowl of known capacity on rigid handle. Has thumb operated rotating vane to release semi-solid contents. Used both to measure and shape contents in serving and portion control.

Scoop Sizes

Number	Measure (level)	Approx. weight
30	2 tablespoons	1 - 1-1/2 oz.
24	2-2/3 tablespoons	1-1/2 - 1-3/4 oz.
20	3 tablespoons	1-3/4 - 2 oz.
16	4 tablespoons	2 - 2-1/2 oz.
12	5 tablespoons	2-1/2 - 3 oz.
10	6 tablespoons	4 - 5 oz.
6	10 tablespoons	6 oz.

Serving equipment

Moist heat -steam and water bath

Dry heat - electrically controlled heating units.

Carts - for transporting food; can be heated or insulated or have cooling elements.

Vacuum containers - used for hot or cold foods.

Infra-red lamps - placed over certain areas of counter in kitchen, as in case of roasts.

Lowerators - portable, one of a kind stacked units, heated or unheated for storage and service. Combination portable lowerators are available (example: cups and saucers).

Sieves - round metal frames with mesh bottoms. May be obtained in several diameters and with several mesh sizes. Used to sift flour and other dry ingredients.

Serving equipment (cont.)

Skids - wooden platforms for storage to keep staples and perishables from the floor.

Skimmer - to skim grease or food particles from soup and sauces; also used for draining food.

HANDOUT #5-7

PREVENTIVE MAINTENANCE

A preventive maintenance program saves money and time. Maintenance and cleaning are integrated functions. Equipment kept clean and oiled will be less apt to develop serious problems than equipment not cared for properly. When machines are cleaned and inspected regularly, small problems will be discovered and necessary repairs made before costly, time-consuming breakdowns occur.

To be effective, maintenance inspection must occur on a regular basis as does the cleaning. The system for keeping records about the equipment, installation, and operating instructions, guarantees, and repairs can be as simple or as complicated as you like. A card like the one below contains most of the information you will need. You may prefer to have the similar information on a full sheet of paper so that it may be filed with the installation and operating instructions or you may choose to develop a notebook that contains this information.

EQUIPMENT RECORD

Item of equipment______________________________

Manufacturer________________ Model No.____________

Address____________________ Motor No.____________

Purchased from______________ Serial No.___________

Purchase date______ Guaranteed for______ Cost______ New____ Used____

Capacity__________ Attachments____________________

Date Description of repairs Cost

____

____

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

A. GOALS OF THIS LESSON

The goal of this lesson is to develop a degree of understanding about non-power equipment essential for convenient and accurate measurement in preparing and serving food in quantity.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. identify the basic small equipment for controlling portion size and quality production every time.
2. select the appropriate equipment for preparing and serving food in desired amounts.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate appropriate handouts.
2. Assemble necessary equipment for demonstration or class lab assignments.

D. KEY WORDS USED IN THIS LESSON

GAUGE:	indicates the weight of the metal
PAN ADAPTER BARS:	stainless steel bars to fit across 12" width of steam table to allow for use of smaller containers
SMALL EQUIPMENT:	items used in food preparation and service which can be held in the hand(s).

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

E. REFERENCES FOR ADDITIONAL INFORMATION

Jernigan, A., Ross, L. Food Service Equipment, 2nd Edition. Ames, Iowa: The Iowa State University Press, 1980.

Terrell, Margaret. Professional Food Preparation. New York: John Wiley and Sons, 1971.

United States Department of Agriculture, Program Act No. 1091, Food and Nutrition Service, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20422, 1974.

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY
I. **INTRODUCTION** Small equipment is any item used in food preparation; preparation or service that is not motor driven.	
A. The Number of Units Purchased For a Kitchen 1. Depends on the number of people being served, menu pattern and kitchen arrangement; 2. May be centrally located and used by entire kitchen; 3. May be located at the point of use.	
B. Proper Use of the Equipment and Preventative Maintenance Will Extend the Life of Most Equipment.	
II. **SMALL EQUIPMENT OR HAND TOOLS FOR STANDARDIZATION PROVIDES SPECIFIC PORTION CONTROL FOR DRY AND LIQUID MEASURE.**	Demonstrate measuring and weighing of food. A demonstration can reinforce the need for accuracy and variations possible.

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

LESSON CONTENT

A. Standard Measurements and Uniform Measuring Practices Are Essential for Repeated Successful Results in Cooking. There are Specific Techniques for Dry and Liquid Ingredients.

B. Dry Ingredients Should Be Weighed When Possible.

1. Weighing has the advantage of greater accuracy than measuring.
2. Scales are a "must" for all kitchens. Types of scales include:
    a. Baker's scales which are usually 16# capacity x ¼ g, used in the measuring of baking supplies and known as balance scales.
    b. Receiving scales which are placed in a location so that supplies can be weighed as they are received.
    c. Portion spring scales (oz) used in determining the right size individual portions.

CLASS ACTIVITY

1. Weigh a cup of unsifted flour.
2. Sift the cup of flour and weigh it to show less weight per volume.
3. Measure liquid and solid fat.

Another option is to have class members do the measuring and report results to the class.

Handout #6-1 identifies various kinds of scales available.

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

LESSON CONTENT

C. If Dry Ingredients Are To Be Measured, Some Specific Rules Include:

   1. Stir contents to prevent packing of ingredients. This is especially true for cornstarch and powdered sugar.

   2. Pack brown sugar until it holds the shape of the container when removed.

D. Measure Liquid Ingredients By Spoon, Cup, Quart or Gallon Measurer Instead of Weighing.

E. To Measure Solid Fats

   1. Press fat firmly into the measure to insure that all air bubbles are removed.

   2. Level the surface with a straight-edge spatula.

   3. Fat can be weighed with more accuracy than by measuring.

CLASS ACTIVITY

Demonstrate by instructor or class participants the following measure similarities or differences with emphasis on a pound.

1. Weigh a pound of flour, then transfer to gallon measure.
2. Pack the gallon measure with flour and re-weigh.
3. Measure brown sugar using the same procedure.

Use Handouts #6-2 and #6-3 to discuss work simplification tools as well as measurer.

LESSON CONTENT	CLASS ACTIVITY
F. Additional Measuring and Weight Equipment That Insures Consistent Results: 1. scoops 2. measuring spoons 3. ladles 4. gallon measures	
G. Equivalents Provide: 1. basic information about the amount to prepare for a given measure; 2. substitutions of products to give the same result; 3. information to assist in standardization of procedures, costing and purchasing practices.	Use Handout #6-4, Equivalent Sheet, depending on the participants' discussion and if problem-solving can be done.

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY
III. SMALL EQUIPMENT OR TOOLS ESSENTIAL FOR EVERYDAY OPERATION. A. Cutting Boards 1. Use 18" x 24" x $\frac{3}{4}$" composition rubber or plastic. 2. Use in all areas where cutting is done. 3. Wash after each use with warm soapy water, rinse and sanitize. B. 3-80 qt Bowls For Hand Mixing: 1. Are aluminum or stainless steel; 2. Bowls are available in larger sizes with mobile stands; 3. Are used in main dish, salad and dessert areas; 4. Hand wash in pot and pan sink, sanitize and air dry.	Small equipment could be collected from kitchens or supply houses and reviewed with the participants as the various items are discussed or the participants could tell which items they have in their own kitchens and how they use them.

LESSON CONTENT	CLASS ACTIVITY
C. Colander (11-16 qt) Aluminum or Stainless Steel: 1. Used in main preparation or salad area for draining fruit or vegetables; 2. Can be used to wash or rinse items such as spaghetti or macaroni. D. Cutlery, Knives Include: 1. A blade a. Carbon--has finest cutting edge, but is affected by food stains and rust; b. Stainless steel--has sharp edge that is long-lasting but not as sharp as carbon. 2. A handle made from a. rosewood, maple, walnut, plastic; b. plastic and/or impregnated wood make very durable, dishwasher-proof handles.	

LESSON CONTENT	CLASS ACTIVITY
3. Spatula a. is 8"-10" long b. has narrow or wide blade 4. Spreader, butter a. has 3"-4" blade b. has flexible blade 5. Turner, "hamburger" a. has 3"-4½" flat area b. is used for turning items in cooking or removing from pan, (i.e., cookies, cakes, etc.) 6. Utility a. has 5"-6" blade b. can be serrated, scalloped or straight	

LESSON CONTENT	CLASS ACTIVITY
7. Vegetable peeler a. used for paring b. has two blades that operate as a pair and rotate on a common axis E. Cutters Include: 1. biscuit, 2" 2. butter, 48 cuts per pound 3. dough, (needed if bread and rolls are baked) F. Dredges/Shakers 1. used for salt 2. used for pepper/spices G. Fork (Cook's) 1. is 12"-14" long with 2 tines 2. has forged hardwood handle	

LESSON CONTENT	CLASS ACTIVITY
H. Can Openers are: 1. institutional which are table-mounted a. manual b. electric 2. small hand openers are used for juices I. Kettle Paddle 1. needed for stirring 2. is 30"-37" long for 20, 30 kettles 3. is 45" long for larger kettle 4. is perforated aluminum or stainless steel J. Pots and Pans Include: 1. Bun or sheet pans - 18" x 26" x 1" or 20" x 24" x 1" a. aluminum--16 gauge	

LESSON CONTENT	CLASS ACTIVITY
b. are widely used in the kitchen--storing, baking shop and carrier on top of utility carts	
2. Double boiler (2 to 25 qt)	
a. can be stainless steel or aluminum	
b. need several sizes if no steam-jacketed kettle available	
3. Food service pans or counter pans--gauge 18-20 or 22	
a. the heavier the gauge the less likely it will warp	
b. food can be prepared and served from the same pan	
c. vary in size and depth	Handout #6-5. Pan capacity in terms of quarts and cups.
(1) most frequently used are full, half-size and third size	

- (2) also available are one-fourth pan and one-sixth pan that could be appropriate for salad bars or *à la carte* lines

- d. have covers, usually 18 gauge stainless steel
  - (1) select best for your needs
  - (2) flat, flat-hinged, semi-domed hinged, clamp on lids

- e. have pan adapter bars, 18 gauge stainless steel
  - (1) fit across the 12" width opening
  - (2) smaller pan sizes can be supported

4. Frying Pans are 6½" to 15½"
   - a. are cast iron or aluminum
   - b. have a silverstone nonstick surface

LESSON CONTENT	CLASS ACTIVITY
5. Roasting pans, heavy duty, are: a. aluminum or stainless steel b. seamless c. with two drop handles d. shallow for even heat distribution 6. Saucepan or stock-pot, heavy duty: a. Saucepan usually has long handle and flat bottom (1) used for top of range cookery (2) vary in size from 1½ qt to 10 qt b. Stock-pots are aluminum or stainless steel (1) have two loop handles (2) vary in size up to 20 qts	

LESSON CONTENT	CLASS ACTIVITY

K. Rolling Pin, heavy duty

1. is 4" x 14"
2. available in special sizes for special uses, for example, pizza rolling pin

L. Sieve, flour

1. is made from aluminum
2. 16" to 20" in diameter

M. Spoons

1. measuring sets are graduated ¼ teaspoon to 1 tablespoon
2. are aluminum or stainless steel
3. stirring are 11"-14" long, solid stainless
4. serving are 12"-14" long, solid, slotted or perforated.

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

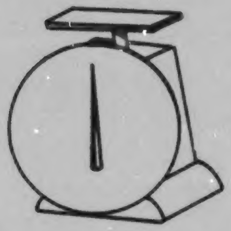
LESSON CONTENT	CLASS ACTIVITY
N. Thermometers 1. Oven are from 200°F to 600°F in 10° scale divisions 2. Meat are from 140°F to 200°F with scale divisions 3. Refrigerator and Freezer are -40°F to +70°F with scale divisions 4. Dry storeroom have temperature range of -20°F to 120°F with 2° scale divisions O. Trays 1. are aluminum or stainless steel 2. are 12" x 16" 3. are 14" x 18" P. Miscellaneous Includes: 1. egg slicer	

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY
2. skimmer	
3. strainer	
4. timer	
IV. **SELECTION AND MAINTENANCE OF SMALL EQUIPMENT**	
A. Purchase the Highest Quality Available Within Budget Allocations.	
B. Purchase Enough Equipment To Meet Current Needs, Plus Replacements Required Throughout The Year.	
C. Provide Instructions and Training in the Use of Equipment	
1. to provide new employees;	
2. refresh memories of all employees on care and handling of equipment	
D. Provide Adequate Storage To Protect Equipment.	

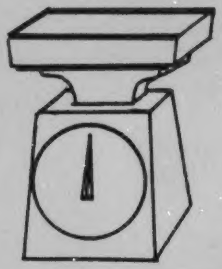
HANDOUT #6-1

SCALES



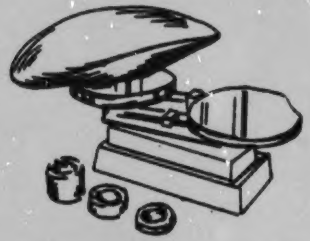
PORTION SCALE

Portion Scale: 1 oz. graduation to 2#
(Essential for portion control)
Some scales are " graduation to 32 oz.



KITCHEN SCALE

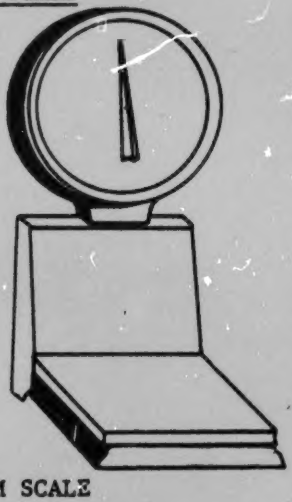
Kitchen Scale: 1# graduation to 25#



BAKER'S SCALE

Baker's Scale: 1# graduations to 8-16#

Used in the kitchen for weighing ingredients



PLATFORM SCALE

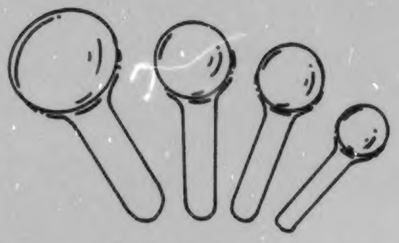
Platform Scale: 60-300#

Should be located in area supplies are received so orders can be checked before storage.

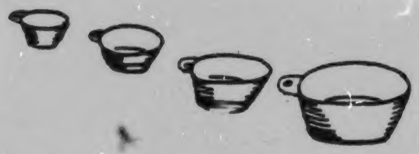
Most scales purchased today are also available in metric.

HANDOUT #6-2

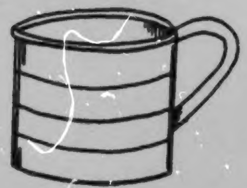
MEASURES



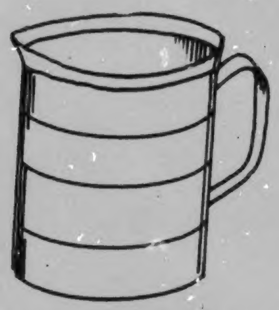
measuring spoons ¼, ½, 1 teaspoon,
1 tablespoon



measuring cup set - ¼, 1/3, ½, 1 C



graduated measuring cup
¼, ½, 3/4, 1



Gallon, each line designates a qt.

UNITS OF MEASURE

pinch/dash = 1/16 t. - 1/8 t
three teaspoons = one tablespoon
two tablespoons = 1 fluid ounce
16 tablespoons = 1 C
1 jigger = 1-½ oz.

2 C = 1 pint
2 pts. = 1 qt.
4 qt. = 1 gallon
8 qt. = 1 peck
4 pecks = 1 bushel

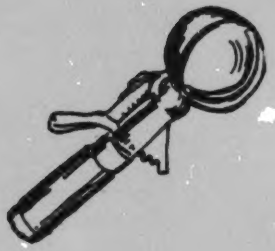
16 oz. liquid = 1 pt. or 1# liquid
8 oz. liquid = 1 C liquid

NO. 10 CAN (13C) EQUIVALENTS

Can Size	Fluid oz.	Net wt. oz.	No.
3 oz.	46	51	2
2½ oz.	27	29	4
303	28	20	7

HANDOUT #6-3

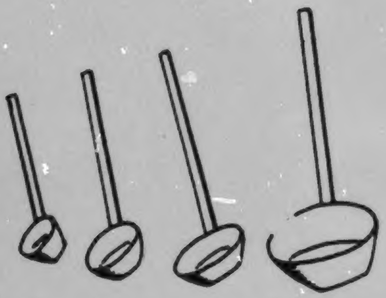
SERVING EQUIPMENT HANDOUT



SCOOPS

SCOOPS

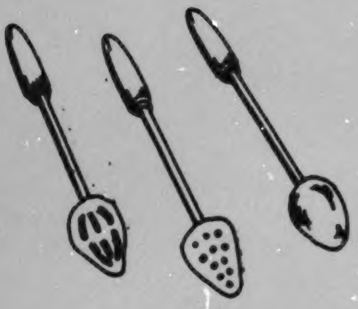
No.	Size	Oz.	Use
30	1/8 C	1	gravies, sauces, salad dressing
16	1/4 C	2	croquettes, desserts, muffins
12	1/3 C	2½	gravies, pancake batter
10	2/5 C	3½-4	desserts, ice cream
8	1/2 C	4	casserole dishes



LADLES

LADLES

No.	Size	Oz.	Use
1	1/4 C	2	sauces and gravies
2	1/2 C	4	soups, or dishes, punch
3	2/3 C	5	
4	3/4 C	6	Soups, chili, chop suey
5	7/8 C	7	
6	1-1/8 C	8	soup, stews, cr. dishes



SERVING SPOONS

SERVING SPOONS

Kind	Use
slotted spoon -	serving vegetables without liquid
perforated spoon -	serving vegetables without liquid
solid spoon -	serving fruit or vegetables without liquid

HANDOUT #6-4

FOOD WEIGHT AND APPROXIMATE EQUIVALENTS IN MEASURE

FOOD	WEIGHT	APPROX. MEASURE
MEATS-POULTRY-FISH		
Bacon, raw	1 lb.	15-25 slices
Beef, ground, raw	1 lb.	2 c.
Beef, cooked, diced	1 lb.	3 c.
Chicken, ready-to-cook	4-4-1/2 lb.	1 qt. (4 c.) cooked diced
Chicken, cooked, cubed	1 lb.	3 c.
Fish sticks	1 lb.	16-1 oz. fish sticks
Ham, cooked, diced	1 lb.	3 c.
Ham, cooked, ground	1 lb.	2 c.
Turkey, AP*, dressed wt.	14 lb.	11-12 c. diced, cooked meat
Tuna	1 lb.	2 c.
Tuna, grated	6 oz.	scant 1c.
Tuna, solid pack (drained & flaked)	7 oz.	1-1/4 c.
FRUITS		
Apples, AP*	1 lb.	3-4 med.
Apples, AP*	1-1/2 lb.	1 qt. (4 c.)sliced
Apples, canned pie pack	1-1/2 lb.	1 qt. (4 c.)
Applesauce	1 lb.	2 c.
Apricots, dried, AP*	1 lb.	3 c. dried
Bananas	1 lb.	3 med.
Lemon Juice (fresh)	1 lb.	2 c. (8-10 lemons)
Lemon Juice (bottled)	8 fl. oz.	1 c.
Pears, fresh	1 lb.	3-4
Pears, canned, drained, diced	1 lb.	2-1/2 c.
Pumpkin, cooked	1 lb.	2-1/2 c.
VEGETABLES		
Beans, baked	1 lb.	2 c.
Beans, Navy (dried)	1 lb.	2-1/3 c.
Beans, Navy 1# dried after cooking	2 lb.3 oz.	5-1/2-6 c.
Bean sprouts	1 lb.	1 qt. (4 c.)
Cabbage, shredded, raw	1 lb.	1 qt. (4 c.) lightly packed
Carrots, ground raw	1 lb.	3 c.

AP* As Purchased

FOOD	WEIGHT	APPROX. MEASURE
Cauliflower, head	12 oz.	1 small
Celery, diced	1 lb.	1 qt. (4 c.)
Onions, AP*	1 lb.	4-5 med.
Onions, chopped	1 lb.	2-3 c.
Onions, dehydrated, chopped	1 lb.	7-1/2 c.
Peppers, green chopped	1 lb.	3 c.
Pickle relish	16 oz.	1-3/4 c.
Potatoes, white, med AP*	1 lb.	3
Potatoes, AP* after cooking (diced, creamed or mashed)	1 lb.	2 c.
Potatoes, instant flakes	6-1/2 oz.	10-4 oz. servings
Soybeans	1 lb.	2-1/2 c. (dried)
Tomato Juice	32 fl. oz.	1 q. (4 c.)
Tomatoes, canned	1 lb.	2 c.
PASTAS		
Macaroni, 1" pcs. AP*	1 lb.	4 c.
Macaroni, 1# after cook.	4 lb.	2-1/2 qt. (10c.)
Noodles, dry AP*, Converted Rice	1 lb.	6 c.
Noodles, 1# AP* after cooking	3 lb.	2-1/2 qt. (10c.)
Rice, AP*	1 lb.	2 c.
Rice, 1# AP* after cook.	4-4-1/2 lb.	2 qt. (8 c.)
Rice, Quick Rice (enriched-precooked long grain) AP*	14 oz.	cooked 12-2/3 c. servings
Rice, Enriched Instant Rice (enriched) AP*	14 oz.	cooked 12-2/3 c. servings
Rice, Minute Rice (Precooked, enriched, long grain) AP*	14 oz.	cooked 12-2/3 c. servings
Rice, Natural Brown, long grain, AP*	14 oz.	1 c. uncooked = 8-1/2 c. servings
Rice, long grain, & wild rice, AP*	6 oz.	cooked 6-1/2 c. servings

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AP* As Purchased

FOOD	WEIGHT	APPROX. MEASURE
Spaghetti, 2" pcs.	1 lb.	5 c.
Spaghetti, 1 lb. AP* after cooking	4 lb.	2-1/2 qt. (10c.)
DAIRY PRODUCTS - FATS		
Cottage Cheese	1 lb.	2 c.
Cheese, grated or ground	1 lb.	1 qt. (4 c.)
Butter	1 lb.	2 c.
Lard	1 lb.	2 c.
Margarine	1 lb.	2 c.
Margarine, whipped	1 lb.	3 c.
Oil, peanut, safflower, vegetable, corn, cottonseed, olive	1 qt.	4 c.
Shortening, hydrogenated	1 lb.	2-1/4 c.
BAKING INGREDIENTS		
Baking powder	1 oz.	2 T
Baking soda	1 oz.	2-1/3 T.
Chocolate	1 lb.	16 (1 oz.squares)
Chocolate, grated	1 bl.	3-1/2 c.
Chocolate, melted	1 lb.	2 c. (scant)
Cocoa	1 lb.	4 c.
Corn Syrup	1 lb.	1-1/3 c.
Cornstarch	1 oz.	3-1/2 T.
Cream of Tarter	1 oz.	3 T.
Flour, all purpose	1 lb.	4 c.
Flour, cake sifted AP*	1 lb.	4-3/4 c.
Flour, soya, low fat	1 lb.	5 c.
Honey	1 lb.	1-1/3 c.
Milk, dry	1 lb.	4 c.
Milk, dry-to make 1c. fluid whole	3 T. non-instant 1 c. water + 2-1/2 t. butter = 1 c. whole milk	
Milk, dry-to make 1c. fluid whole	1/3 c. instant nonfat + 1 c. water + 2-1/2 t. butter = 1 c. whole milk	
Milk, fluid	1 lb. 1 oz.	2 c.
Milk, evaporated	1 lb.	1-2/3 c.
Molasses	1 lb.	1-1/3 c.

AP* As Purchased

FOOD	WEIGHT	APPROX. MEASURE
Sugar, brown-Brownulated (granulated)	1 lb.	3 c.
Sugar, brown-solid pack	1 lb.	2 c.
Sugar, regular or granulated	1 lb.	2-2-1/8 c.
Sugar, powdered	1 lb.	3 c.
Vanilla	1-1/2 oz.	1 T.
MISCELLANEOUS		
Bread, loaf	1 lb.	18 slices 1/2" thick
Bread, sandwich	1-1/2 lb.	24-27 slices
Bread, sandwich	2 lb.	36-40 slices thin
Bread, sandwich	20 oz.	19-21 slices
Bread, crumbs	1 lb.	8-9 c.
Bread, soft crumbs	1 lb.	2 qts. (8 c.)
Coffee, regular	1 lb.	5-5-1/2 C. - makes 40 c.
Coffee, instant	1 oz.	1/2 c.
Cornflakes	1 lb.	1 qt. (4 c.)
Cremora	11 oz.	128 t. (scant 2-1/2 c.)
Graham Crackers	1 lb.	3 c.
Mayonnaise	1 lb.	2 c. (scant)
Oats, rolled, Quick AP*	1 lb.	6 c.
Oats, rolled, Quick, 1# after cooking	2-1/2 lb.	4 qt. (16 c.)
Peanut butter	1 lb.	1-3/4 c.
Raisins	1 lb.	3 c.
Salad dressing	1 lb.	2 c.

AP* As Purchased

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Prepared by: Jean McFadden, Extension Specialist,
Food Service Management, MSU

MSU-NET
FSHN/81

Handout #6-5

COUNTER PANS AND CAPACITIES

SIZE PAN (Inches)	DEPTH (Inches)	CAPACITY	
		Quarts	Cups
FULL SIZE 12 x 20	2½	7½	30
FULL SIZE 12 x 20	4	13	52
FULL SIZE 12 x 20	6	19½	78
HALF SIZE 12 x 10	2½	3 3/4	15
HALF SIZE 12 x 10	4	6½	26
HALF SIZE 12 x 10	6	9 3/4	39
THIRD SIZE 12 x 6 7/8	2½	2 2/5	9 3/5
THIRD SIZE 12 x 6 7/8	4	3 7/8	15½

Lesson 7 PROGRESS TEST FOR LESSONS 5 and 6

A. GOAL OF THIS LESSON

The goal of this lesson is to review the most important aspects of the past 2 lessons, by administering the following Progress Test.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. summarize and review the important information presented in Lessons 5 and 6.
2. emphasize the most important points presented in Lessons 5 and 6.
3. identify subject areas in which participants desire or need further study and practice.

Note: The Progress Test should NOT scare or humiliate participants or be used as a device to keep them from continuing on with further lessons. There is no minimum score of success. This is an exercise or learning activity just as the other lessons have been.

C. INSTRUCTOR PREPARATION FOR CLASS PROGRESS TEST

1. the time allowed for this lesson is approximately 25 minutes.
2. duplicate sufficient copies of Progress Test.
3. How the Progress Test should be given:
    a. pass out copies of the progress test to each participant.
    b. provide pens or pencils for those who may not have brought their own.

c. explain that the reason for this Progress Test is to review the important information presented in the past three lessons.
d. briefly go through the test together to explain the different kinds of questions to be sure that all participants know what they need to do for each question.
e. allow approximately 25 minutes for participants to complete the test.
f. allow participants to keep their own test while answers are discussed.
g. state aloud which answer(s) are correct for each question.
h. discuss how to change false statements so they read "true".
i. lead a class discussion relating to reasons why other choices, if given, are incorrect. Ask participants to give examples of the application of each question to their school foodservice situation.
j. allow any participants who desire to do so to retake the test on their own time.
k. Provide additional references on any topic to participants who desire further information.

LESSON 7 - PROGRESS TEST FOR LESSONS 5 and 6

In the space to the left of the number, place a (T) if the statement is true and a (F) if it is false.

_____ 1. The smaller the scoop number the larger the scoop size.

_____ 2. Slotted serving spoons insure serving vegetables without extra liquid.

_____ 3. A No. 2 ladle will provide a 1/2 c serving of soup or punch.

_____ 4. A number 10 can of green beans equals 13 cups of beans and liquid.

_____ 5. Sixteen tablespoons equals 1 c.

_____ 6. Mixing bowls and counter pans are considered small equipment.

_____ 7. Gauge indicates the weight of the metal.

_____ 8. The amount of small equipment needed in the kitchen depends on the organization of the kitchen, menu and number of people served.

_____ 9. A French knife is tapered evenly to a sharp point from a wide base at the handle.

_____10. Scissors work more efficient than knives to cut dates, marshmallows and vegetables.

_____11. Purchase heavy duty well constructed tools whenever possible as it saves money and time.

_____12. Small equipment and hand tools are terms that mean the same thing.

_____13. Colanders, china caps and strainers are used for draining or straining foods.

_____14. Plan a definite place to store small equipment and be sure to return to that place every time it is used.

_____15. A serving counter that includes pans of various sizes is more attractive and food is not wasted.

_____16. A deck oven can be used for baking, roasting or holding foods.

_____17. A convection oven cooks faster than a regular oven and is hotter so standard recipe temperatures need to be lowered 25 to 50°.

_____18. A pressure steamer is a dangerous piece of equipment.

_____19. The manufacturer's operating book should be followed in order to get maximum efficiency from equipment.

_____20. Overloading deep fat fryers produces a poor product.

_____21. A griddle is used more for breakfast items than the noon meal.

_____22. Maintenance record on all major equipment provides a running account on the performance of the equipment.

_____23. A table model mixer if on wheels can be used in all areas of the kitchen.

_____24. Food choppers are labor saving devices but care must be taken in using them.

_____25. Custom-made equipment is constructed according to customer's specifications and is usually more expensive than standard equipment.

ANSWER SHEET

All answers are true.

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic techniques for preparing various types of beef, pork, poultry, macaroni products, and rice.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. identify the grades available for beef, pork and chicken;
2. describe basic cooking principles and their effect on meat's structure, color, flavor and doneness;
3. describe the qualities of a good piece of cooked meat or poultry;
4. describe and define the various types of dry and moist heat cooking methods;
5. describe the advantages and procedures used in handling frozen meats;
6. describe the proper ways of handling, cooking and storing ground meats;
7. identify important preparation techniques unique to poultry products;
8. describe the uses and preparation techniques recommended for macaroni products and rice;
9. prepare correctly various entree recipes using beef, pork, poultry, rice or macaroni products, as assigned.

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C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.
2. Locate a chalk board for use in the classroom and an overhead projector.
3. Check with suppliers of fat and shortening to see if a film is available for viewing.
4. Arrange for use of a quantity kitchen for participants to use, and arrange for the purchase of ingredients needed to prepare sample recipes included in this lesson. If a kitchen is not available, arrange for sample products to be prepared in advance for participants to evaluate, using the recipes included with this lesson.
5. Obtain a large meat chart from your meat supplier or the National Livestock and Meat Board, Chicago, Illinois.
6. Obtain a fat analyzer for demonstration.

D. KEY WORDS USED IN THIS LESSON

SHRINKAGE: the decrease in weight of a food product, usually a result of cooking; generally because of a loss of juices and fats, and evaporation.

YIELD: the amount of a food product remaining after processing or cooking.

CYROVAC: a process in which meat or poultry is placed in a moisture-vapor-proof wrap and air is exhausted. Examples of this packaging technique are very common in institutional markets and in retail grocery stores.

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LESSON 8 : MEATS, POULTRY AND STARCH COOKERY

MYOGLOBIN: the main color pigment that makes meats red in color; it is not heat stable and changes to a gray or grayish-brown color when meat is heated.

HEMATIN: the gray or grayish-brown color pigment found in cooked meats; it is the myoglobin pigment after the color change has occurred as the result of being heated.

COLLAGEN: white-colored connective tissue found in meats; changes into gelatin and water when exposed to moist heat.

ELASTIN: yellow connective tissue found in meats; is not tenderized by heat and must be broken down by mechanical means, such as cubing, pounding or grinding.

SLURRY: a thickened liquid, such as a gravy or sauce; wheat flour is usually used as the thickener.

HEAT STABLE: food is not affected by exposure to heat.

DERIVED PROTEIN CONCENTRATE: food protein products used as additives in fortifying selected other food items.

MACARONI PRODUCTS: a variety of different alimentary pastes which are shaped and dried doughs; include noodles, spaghetti and macaroni type items.

COMPARTMENT STEAMER: the traditional stacked double or triple chamber steamer which cooks foods under pressure.

ENRICHED MACARONI PRODUCTS: noodle, spaghetti and macaroni type items to which certain vitamins and minerals have been added, restoring these nutrients to the levels found in the wheat food prior to milling and processing. Specified amounts of these products may be used to meet the bread requirement in Child Nutrition Programs.

LESSON 8 : MEATS, POULTRY AND STARCH COOKERY

PROTEIN FORTIFIED MACARONI PRODUCTS:	enriched noodle, spaghetti and macaroni type products to which high protein ingredients have been added. One ounce of this dry product may be used for 50 percent but not more than 1 ounce of the protein requirement in Child Nutrition Programs.

E. REFERENCES FOR ADDITIONAL INFORMATION

Kotschevar, Lendal H. *Standards, Principles and Techniques in Quantity Food Production*. Boston, MA: Cahners Books, CBI Publishing, Inc., 1974.

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__________, *Understanding Food*, New York: John Wiley and Sons, 1969.

National School Lunch Act, Appendix A, Amendment 16, Part 210.

Terrell, Margaret E. *Large Quantity Recipes*. New York: J. B. Lippincott, 1975.

__________, *Professional Food Preparation*. New York: John Wiley and Sons, Inc., 1979.

USDA Fact Sheet. *How to Save Money With Large Cuts of Meat*. Washington, D. C.: USDA AFS-6-4-1, 1981.

West, B. B., Shugart, G. S., and Wilson, M. F. *Food for Fifty*. New York: John Wiley and Sons, Inc., 1979.

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT	CLASS ACTIVITY
I. MEAT COOKERY AS DESCRIBED IN THIS LESSON INCLUDES BEEF, PORK AND POULTRY PREPARATION, ALTHOUGH THE TECHNIQUES USED FOR THESE MEATS MAY ALSO APPLY TO LAMB, VEAL AND SOME VARIETY OF MEATS SUCH AS LIVER OR TONGUE.	
A. Meat Is Usually the Main Meal Item.	
1. Its selection frequently dictates the other foods served in the meal.	
2. It is the most costly item of the meal.	Make a transparency of Handout #8-1 and distribute copies to class participants to use as an outline to follow the first portion of this lesson.
3. Improper preparation methods giving poor yields have adverse effects on the food budget.	
B. Meat Cooking Methods and Eating Quality Are Influenced By the Tenderness and Amount of Fat in the Meat Tissues.	
1. These are gauged in large part by the grade and cut of the meat.	
2. Grading of meats and poultry	

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT

CLASS ACTIVITY

a. Beef is graded for quality and yield.

   (1) Quality beef grades that food-service operators use include:

      (a) prime

      (b) choice

      (c) good

      (d) standard

   (2) Yield beef grades indicate the amount of meat that a cut or a carcass will yield:

      (a) yield Grade 1 - largest amount of meat per cut, through

      (b) yield Grade 5 - least amount of meat per cut.

b. Pork is graded for quality:

LESSON CONTENT	CLASS ACTIVITY
2. Cuts of Meat	
a. Identification of the various cuts of beef and pork is a complex and difficult task, requiring direct experience in meat cutting and butchering.	
b. Most foodservice operators depend on reliable meat vendors or purveyors to provide them with information on the best cuts of meat to buy for specific purposes.	
c. The charts provided in Handout #8-1 may be helpful in identifying which part of the carcass yields particular cuts of meat.	Distribute Handout #8-1, and ask class participants to identify the wholesale cut from which the following retail cuts come:
d. Large wall posters showing these charts frequently are available from the National Livestock and Meat Board.	Beef: stew beef blade cut pot roast beef patties T-bone steak

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LESSON CONTENT	CLASS ACTIVITY
(1) U.S. Choice with 3 divisions: (a) No. 1 - highest percentage of lean cuts per carcass (b) No. 2 - second highest percentage of lean cuts per carcass (c) No. 3 - lowest percentage of lean cuts per carcass (2) U.S. Medium (3) U.S. Cull c. Poultry is graded A, B and C. d. Additional information on how meat and poultry grades are determined is available in the reference books, Professional Food Preparation, by Margaret E. Terrell, and Quantity Food Purchasing, by Lendal Kotschevar. Your local meat purveyors may also be able to provide details on meat standards and grading requirements.	

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT

C. Cooking Principles for Meats and Poultry Include a Basic Understanding of Tissue Composition and Structure, Ripening, Color Changes During Cooking, Flavor Factors, and Doneness.

1. The composition of meat is about 25% solids and 75% moisture. Cooking methods attempt to preserve as much of this original moisture as possible.

2. Meat tenderness is affected by the quantity and kind of connective tissue present in the meat. There are two kinds of connective tissue.

   a. Collagen is white in color and is changed into gelatin and water by exposure to moist heat. This gelatin is sometimes evident as a part of meat drippings and may solidify in a layer when refrigerated.

   b. Elastin, or yellow connective tissue, is not changed by cooking and must be made tender by mechanical treatment, such as cubing, pounding or grinding.

CLASS ACTIVITY

Pork:
picnic ham
blade loin roast
loin chop
bacon
luncheon meats

LESSON CONTENT	CLASS ACTIVITY
3. Meat ripening, or aging, refers to holding the meat at temperatures between 35°F and 40°F under controlled humidity. a. Aging increases the flavor, tenderness and moistness of the meat. b. The most common process for aging today is called Cryovac aging, which is a process in which meat is placed in a moisture-vapor-proof wrap, air is exhausted, and the meat held under controlled refrigeration. When Cryovac meat is first opened, it may have a musty odor, but this soon disappears and is not detrimental. 4. Heat during the cooking process coagulates meat proteins from 160°F to 175°F, changing the color, the flavor and giving firmness which we call doneness. a. The shrinkage loss during cooking varies according to the cut and type of meat and the amount of fat on the meat, but the most influential factor is temperature.	

LESSON CONTENT	CLASS ACTIVITY
(1) Cooking at high temperatures increases shrinkage and thus increases portion costs. (2) A constant low cooking temperature saves fuel, reduces spattering and burning, and may provide a lower portion cost. b. Meat's red color is from myoglobin pigments primarily; heat turns myoglobin to a gray or grayish-brown substance called hematin. (1) Cured meats are red after cooking because the myoglobin combines with the nitrogen of the curing salts to form a heat stable pigment. (2) Dehydrated onions processed in nitrogen gas may give a red, uncooked appearance to cooked foods such as meatloaf or cabbage rolls.	

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT	CLASS ACTIVITY

c. The flavor of meats is affected by a variety of things:

   (1) the fat within the tissues

   (2) the diet of the animal

   (3) the breed, sex and age of the animal

   (4) the muscles of the animal

d. Meat is cooked to make it more palatable and perhaps more digestible.

   (1) Doneness may be judged by outside appearance and internal temperatures, as determined by a thermometer. Stages of doneness include:

      (a) Beef--rare 140°F, medium 160°F, well 170°F

LESSON CONTENT	CLASS ACTIVITY
(b) Pork--well done only, 165°F to 175°F	
(c) Pork, cured--well 155°F	
(d) Poultry--medium 165°F, well 180°F	
(2) Large pieces of meat such as ham, pork roast or turkey, increase in internal temperature after removal from the oven. Thus, these meats should be cooked from 15°F to 25°F lower than needed at service time.	
(3) Meat at room temperature cooks more rapidly than refrigerated meat.	
(4) Cooking times for frozen meat are 2 to 3 times those of refrigerated meat.	
(5) Boned meats take longer to cook than unboned ones because heat travels faster through the more solid bone material than through the fleshy parts of meat.	

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT

CLASS ACTIVITY

(6) To cook meat by the pound, calculate time by the piece and not the entire pan contents. For example, if six beef roasts are to be roasted, and each weighs 7 pounds, calculate the roasting time for seven pounds, not for 42 pounds.

D. Standards for Meats Are Listed Below and May Vary Slightly for Poultry.

1. Be of good flavor and pleasing in appearance.

2. Drippings should be rich and of good color.

3. Texture should be moist, not dry or crumbly with firmness consistent with doneness.

4. Be tender and not pulpy, stringy or excessively soft, greasy or oily.

LESSON CONTENT	CLASS ACTIVITY
5. Color should be natural to the meat, cooking and degree of doneness with no burned portions or burned taste.	
6. Sliced meat should be firm, juicy and tender, and hold its shape.	
7. Bacon should be crisp but not brittle.	
8. Browned meats should have a rich brown, even color with a well-developed flavor and aroma.	
E. Meat's Tenderness Largely Dictates How It Should Be Cooked.	
1. Tender cuts are usually cooked by dry heat and tough cuts by moist heat.	
2. Dry heat methods include broiling, roasting, sautéing or grilling, deep-frying, and ovenizing.	
a. Broiling means cooking by radiant heat, usually from an overhead source. Broiling is seldom done in Child Nutrition Programs usually because of a lack of broiling equipment.	

LESSON CONTENT	CLASS ACTIVITY
b. Roasting is the term applied to cooking or broiling meats in an oven. (1) Meat for roasting should cover the pan and not leave space for drippings to burn. (2) Never pierce lean flesh of a roast while trying to turn or handle it since valuable internal juices will run out, causing a drier end product. (3) Never salt a roast until after it is browned since salt retards browning. For Child Nutrition Programs, salting roasted meats should be eliminated. (4) Place meat fat side up and poultry with the breast side down; as internal fats and juices cook out, they will run down over the meat and help keep it juicy.	

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LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT	CLASS ACTIVITY
(5) In roasting large batches of meats, select the smallest piece in the lot and insert a thermometer in the center of the largest muscle, making sure not to touch any internal bones. (a) When the proper internal temperature is reached, remove the thermometer and that piece of meat. (b) Insert the thermometer in the next smallest piece until it is done. (c) Continue until all pieces are done. (6) Allow most roasts to stand 30 to 60 minutes before carving. (a) Standing allows for the last rise in internal temperature.	Distribute Handout #8-2 and briefly review the information about time and temperature for roasting meats. Participants can use it as a reference at a later date.

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT	CLASS ACTIVITY
(b) Meats are easier to slice if they have been allowed to stand for this period of time.	
(7) To carve, cut against the grain in thin slices.	
(a) Machine-slicing on an electric slicer gives, on the average, more portions per pound than handslicing.	
(b) Slicing slightly undercooked meats that have been thoroughly chilled produces neat slices and a good total yield of usable portions with little trim or waste from irregular or broken pieces.	
(c) Sautéing or grilling is cooking meat in a thin layer of fat. If it is cooked or immersed in deep fat, it is called deep-fat frying.	Grill 4 beef patties until well browned, where little pink juice is still evident. Cook 4 more patties on high heat, lightly browning each side so a

LESSON CONTENT	CLASS ACTIVITY
Note: The highly specialized techniques involved in frying foods is discussed in detail in the reference text, Standards, Principles and Techniques in Quantity Food Production, by Lendal Kotschevar, Chapter 12. (d) "Ovenizing" describes a process in which meats are baked by being placed onto well-greased baking sheets or pans and then put into an oven so that they fry or sauté.	good deal of pinkness remains in the center of the patty and bright red juices are still evident. Hold both batches of patties for 45 minutes in a heated cabinet at 140°F to 160°F, as if being held warm prior to service. Ask participants to evaluate both products using the evaluation form on Handout #8-3.
(1) Oven temperatures of 325°F to 425°F are usually used.	
(2) Smaller foods, such as tater tots, are ovenized at higher temperatures than larger foods such as pork chops or sliced liver.	See Handout #8-4, page 5, for proper grilling techniques and a listing of problems and possible causes frequently found in grilling operations.

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT	CLASS ACTIVITY
(3) Ovenizing is used to process greater quantities of food than can be prepared by sautéing.	Review the contents of these two charts with class participants.
3. Moist heat methods include braising (also called potroasting, fricasseeing, swissing or stewing), simmering (also called poaching, stewing or boiling), and steaming.	
a. Meat cooked in its own juices or in a bit of added moisture is braised. Stewing, potroasting, fricasseeing and swissing are forms of braising.	
(1) Stewing or simmering differs in that a larger quantity of moisture is used.	
(2) The size of braised meat may be large as for potroasts, or portioned for Swiss steak, or in inch cubes for a slurry, or ground hamburger for a casserole.	

LESSON CONTENT	CLASS ACTIVITY
(3) Often before braising, the meat is floured. b. Cooking meats in a large quantity of water or other liquid is called poaching, boiling, stewing or simmering. (1) Few meats are boiled. (2) To simmer, bring the water to a boil, add the product and hold the temperature from 185°F to 205°F. (3) Simmer poultry at about 190°F. c. Some meats or poultry are steamed under pressure as a part of preparation. For example, portioned chicken may be floured or breaded, steamed and then fried in deep fat close to service.	

LESSON CONTENT	CLASS ACTIVITY
F. The Quality of Frozen Meat Products Is So Good That Many Foodservice Operations Use Frozen Meats and Poultry Almost Totally. 1. Frozen meats are cooked by the same methods used for non-frozen meats. 2. Better flavor and higher nutrient values result if meat is cooked from the frozen or partially frozen state because the drip or liquid that exudes from the frozen product is high in nutrient and flavor substances. Cooking before such loss occurs reduces drip loss and gives a good final yield. 3. Because of time restrictions, it may not be possible to cook meat from the hard-frozen state; partial thawing reduces the required cooking times. 4. Hard-frozen meats take about 3 times as long to roast as refrigerated meats.	

LESSON CONTENT	CLASS ACTIVITY
a. Roast in a 325°F or less oven. b. Cook until thawed, and then insert thermometer. c. Continue to roast as directed under the roasting instructions in section E., b., above. 5. If thawing is required in order to portion or bread a product, thaw meat wrapped, under refrigeration, allowing 1½ hours per pound in a piece. Thus, a 30 lb turkey would take approximately 45 hours to thaw in a refrigerator. G. Ground Meats Are Used Frequently In All Child Nutrition Programs and Require Specific Handling Techniques. 1. Ground beef is sold and priced based on the amount of lean meat as compared to fat.	

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT	CLASS ACTIVITY
a. Most hamburger is sold in a 70:30 ratio of lean to fat. b. Better grades of ground beef contain ratios of 75:25 and 80:20. c. Buying ground beef from a reputable purveyor will assure you of receiving the lean:fat ratio you have specified. d. Some foodservice operators purchase a simple instrument called a fat analyzer or tester so that they can periodically check the fat content of the ground meats they are buying.	Brown 1 lb of ground beef on medium low heat just until the pink is gone. Brown a second pound of ground beef on high or medium high heat until a deep brown color is developed. Weigh both cooked end products and compare yields of each method used. Discuss the differences observed by participants in color, flavor, juiciness and cost per cooked ounce. Refer to Handout #8-5.
2. When browning ground meat prior to adding it to a recipe, the following steps are recommended: a. When braising or browning the meat, do not use a high heat setting because this tends to produce an overcooked end product.	If possible, borrow a fat analyzer or tester from an ISD office, or from a large school district or other source, and run a test on several meat samples to verify the lean/fat ratio. From each meat sample, run at least 5 tests and

LESSON CONTENT

b. Stir the ground meat frequently during the browning process so that all particles of meat have contact with the heated pan sides.

c. COOK ONLY UNTIL THE PINK COLOR IS GONE, and a gray-brown color remains.

   (1) Cooking the meat to a dark brown is usually not necessary.

   (2) Overcooking is easy to do when browning ground meats.

   (3) Overcooking merely cooks additional moisture out of the meat and leaves a dry, less tasty end product.

d. Drain the cooked meat well.

   (1) Drained off liquids and fats may be refrigerated.

   (2) When chilled, the solid fat can be removed from the top and the remaining juices used in gravies or soups. Strain it prior to use, if necessary.

CLASS ACTIVITY

average the results obtained.

LESSON CONTENT

CLASS ACTIVITY

3. Ground meats spoil more quickly because of additional exposed surfaces. It should be stored under refrigerated temperatures of 36°F to 40°F and used within 2 days.

H. Canned Beef and Pork Products Have Been Used Successfully in Child Nutrition Programs.

1. When using canned meat products, remember to:

   a. delete the salt, if included as one of the recipe ingredients;

   b. utilize the can juices as part of the recipe liquids, if possible.

   c. Add the canned meat at the end of the cooking period whenever possible since it is already a fully-cooked product.

2. Canned meat products may be substituted in almost any recipe that calls for cooked meat as an ingredient. This might include items such as beef goulash, pork chop suey or chow mein or barbecued beef.

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

LESSON CONTENT	CLASS ACTIVITY
I. INTRODUCTION Small equipment is any item used in food preparation; preparation or service that is not motor driven. A. The Number of Units Purchased For a Kitchen 1. Depends on the number of people being served, menu pattern and kitchen arrangement; 2. May be centrally located and used by entire kitchen; 3. May be located at the point of use. B. Proper Use of the Equipment and Preventative Maintenance Will Extend the Life of Most Equipment.	
II. SMALL EQUIPMENT OR HAND TOOLS FOR STANDARDIZATION PROVIDES SPECIFIC PORTION CONTROL FOR DRY AND LIQUID MEASURE.	Demonstrate measuring and weighing of food. A demonstration can reinforce the need for accuracy and variations possible.

LESSON 6 : MEASURING, PORTIONING AND SMALL EQUIPMENT

LESSON CONTENT

A. Standard Measurements and Uniform Measuring Practices Are Essential for Repeated Successful Results in Cooking. There are Specific Techniques for Dry and Liquid Ingredients.

B. Dry Ingredients Should Be Weighed When Possible.

1. Weighing has the advantage of greater accuracy than measuring.

2. Scales are a "must" for all kitchens. Types of scales include:

   a. Baker's scales which are usually 16# capacity x ¼ g, used in the measuring of baking supplies and known as balance scales.

   b. Receiving scales which are placed in a location so that supplies can be weighed as they are received.

   c. Portion spring scales (oz) used in determining the right size individual portions.

CLASS ACTIVITY

1. Weigh a cup of unsifted flour.
2. Sift the cup of flour and weigh it to show less weight per volume.
3. Measure liquid and solid fat.

Another option is to have class members do the measuring and report results to the class.

Handout #6-1 identifies various kinds of scales available.

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT	CLASS ACTIVITY

I. Although Many of the Preparation Techniques Used For Cooking Poultry Are Similar to Those For Beef and Pork, a Few Differences Need Mentioning.

1. Chickens and turkeys are very perishable and should be used as quickly as possible. Do not store over 2 days.

2. Leftover cooked poultry products should be used within 24 hours or frozen for later use.

3. Large birds may be split lengthwise in half and roasted, or the breasts, legs and wings may be roasted separately.

4. For large turkeys, consider poaching which increases the yield, the moistness, flavor and tenderness of the meat over the roasting method.

    a. Poaching takes about half the time of roasting, which saves energy.

LESSON CONTENT	CLASS ACTIVITY
b. If boned before poaching, much of the meat can be cut on a slicer which gives more attractive, uniform portions.	
5. Decisions on whether to buy whole birds, turkey parts or turkey rolls, depends on the food budget, the amount of labor available, and the standards established for the end product.	Discuss with class participants the advantages and disadvantages of using whole birds, turkey parts either raw or cooked, or turkey rolls. Review the customers' response to these items, their effect on production loads, and the quality of the end product.
6. The roasting temperatures for either chicken or turkey is usually 325°F, but low-temperature roasting at 250°F results in less shrinkage and a better yield.	
7. Because of the possibility of inadequate heat penetration to the center of the dressing which may cause dangerous bacterial growth, it is best not to stuff dressing in a turkey. Dressing browned separately in a counter pan presents a better appearance and is easier to serve.	If possible, roast a large chicken at 350°F and another at 250°F. Compare end products for appearance, flavor, juiciness, yield and portion cost.

LESSON CONTENT	CLASS ACTIVITY
8. Do not start cooking poultry or meat one day and then finish it the next. This procedure tends to encourage dangerous bacterial growth because the product travels through the temperature danger zone 3 or 4 times. For example, this might include: a. original heating, passing through the 40°F to 140°F range; b. first chilling of the partially cooked product passing from 140°F down to 40°F or below; c. second heating the next day, again passing through the 40°F to 140°F temperature range; d. possible second cooling as the thoroughly cooked product is sliced or portioned for service. A fifth cycle may also occur as the portioned product is end-heated for service.	

LESSON CONTENT	CLASS ACTIVITY

II. PREPARATION TECHNIQUES FOR STARCH PRODUCTS SUCH AS MACARONI AND RICE ARE SPECIFIC AND SIMPLE.

A. Macaroni Products Are Shaped and Dried Doughs Made From the Inner Part of the Wheat Kernel.

1. The best macaroni products are made from durum wheat.
    a. This inner portion of the wheat kernel is called semolina wheat.
    b. It produces a product that holds its shape after cooking, has some texture and does not collapse.
2. Macaroni products that cook up soft and flabby are made from a lesser quality wheat.

B. Enriched Macaroni Products Have Had Nutrients Added To Them That Were Lost In the Milling Process. These May Include Thiamin, Riboflavin, Niacin, and Iron.

LESSON CONTENT | CLASS ACTIVITY

C. Protein-Fortified Macaroni Products Are the Enriched Products With High Protein Ingredients Added.

1. These added ingredients may include such things as non-fat dry milk, or derived protein concentrates.

2. One ounce of this dry product is equal in protein content to a one-ounce serving of cooked meat, and may be used as an alternate for not more than one ounce of the cooked meat requirement or 50% of the meat requirement.

3. When used in Child Nutrition Programs, protein-fortified macaroni products must be mixed with at least an equal amount of cooked meat, poultry, fish or cheese.

4. These products are available in a variety of forms, such as elbow macaroni, spaghetti, lasagne noodles and egg noodles.

5. To be used in Child Nutrition Programs, this product must meet the specifications listed in the National School Lunch Act, Appendix A, Amendment 16, Part 210.

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

LESSON CONTENT	CLASS ACTIVITY

D. All Macaroni Products Are Prepared In a Similar Manner.

1. Bring unsalted water to a boil. Adding a little oil will prevent the water from boiling over.
2. Slowly stir in the macaroni product.
3. Allow water to continue to boil until all of the product is wet and not sticking together. Stirring is required at this time.
4. Reduce heat and cook covered for 6 to 12 minutes, or until tender.
    a. Do not overcook.
    b. Test for doneness by pressing a piece with a fork or spoon against the side of the kettle or pot or between the fingers.
    c. If it breaks cleanly and easily, it is cooked.

LESSON CONTENT	CLASS ACTIVITY
E. Rice Is Available In A Variety Of Types, Each Having Different Processing.	
1. Long grain rice is the most commonly used in foodservice.	
a. Converted long grain rice has been steamed, nutrients added, and then the product has been re-dried.	
b. Instant long grain rice has been pre-cooked and then dried and is usually fortified with nutrients.	
2. Cooking procedures for rice are similar to those used for macaroni products as described in section II., D., above.	If possible, provide samples of raw and cooked macaroni products that demonstrate the shape varieties that are available. Handout #8-5 shows a few of the many varieties available on the market.
F. Both Macaroni Products and Rice May Be Cooked In a Compartment Steamer.	
1. Use a recipe designed for this procedure.	
2. Follow the equipment manufacturer's cooking instructions.	

LESSON 8 : MEAT, POULTRY AND STARCH COOKERY

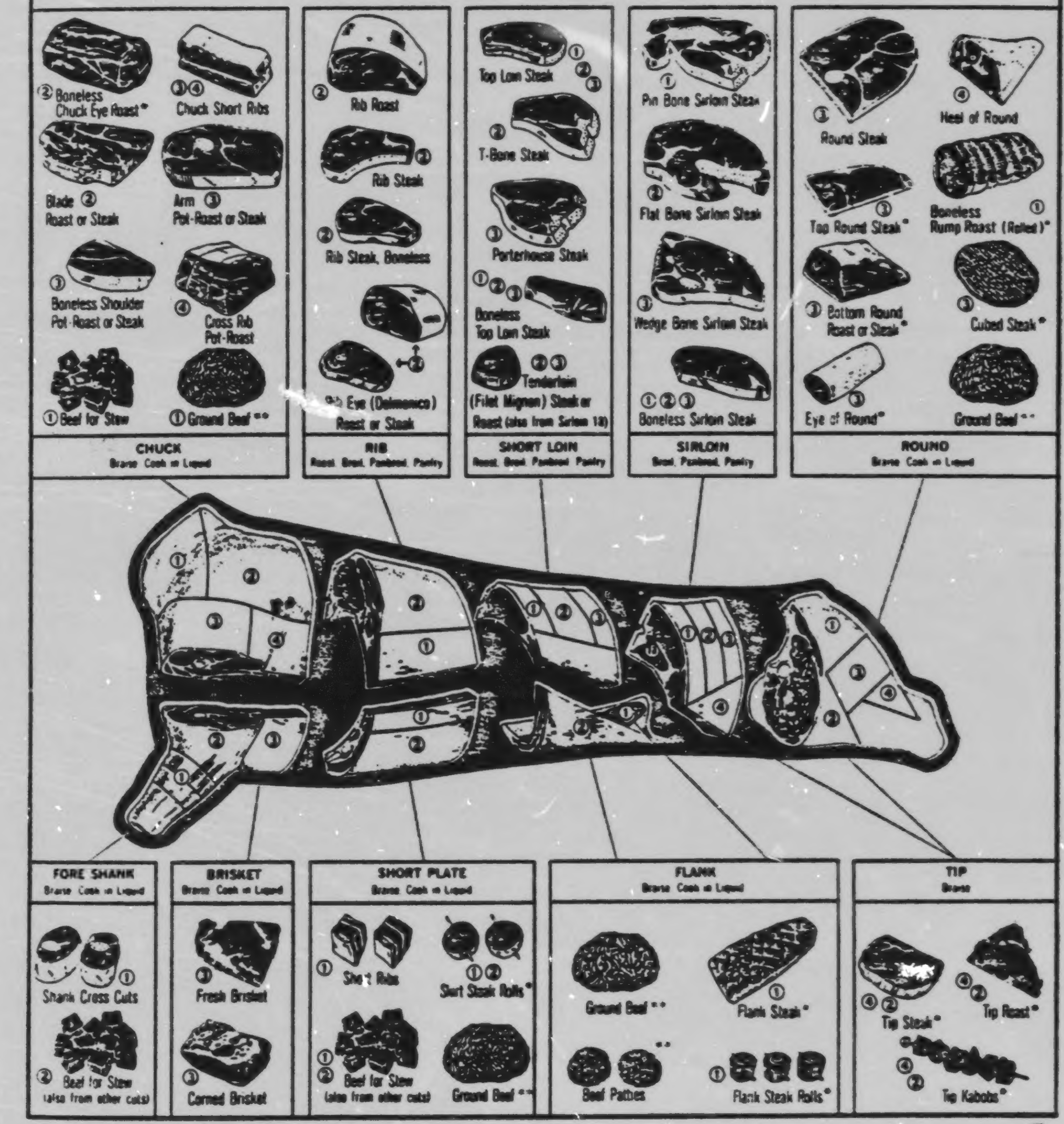
LESSON CONTENT	CLASS ACTIVITY
G. Average Cooking Yields for Macaroni Products and Rice. 1. One pound of rice equals 3 to 4 pounds of cooked product that measures 1½ to 1 3/4 quarts. 2. One pound of macaroni equals 4 lbs of cooked product that measures 2¼ to 2½ qts. 3. One pound of noodles equals 3 lbs of cooked product that measures 2 quarts. H. Macaroni Products Are Available in Over Two Dozen Different Shapes and Varieties. Changing the Shape of the Noodle in a Standard Recipe May Provide An Interesting Variation for the Menu.	Note to Instructor: Try to obtain the following macaroni types for this demonstration: spaghetti rings, stars and alphabets macaroni shells of two different sizes elbow macaroni of two different sizes cut macaroni twisted egg noodles fine noodles wide noodles bow-tie noodles rigatoni mostaccoli space noodles spaghetti wheels Divide participants into pairs and assign each couple one of the recipes to prepare on Handouts #8-6 through #8-14. Use

LESSON CONTENT	CLASS ACTIVITY
	the evaluation form on Handout #8-3 to judge the quality of each product prepared. Note to Instructor: See the Instructor's Guide for this activity on Handout #8-6.

Handout #8-1

BEEF CHART

RETAIL CUTS OF BEEF — WHERE THEY COME FROM AND HOW TO COOK THEM


② Boneless Chuck Eye Roast*
③④ Chuck Short Ribs
Blade ② Roast or Steak
Arm ③ Pot-Roast or Steak
③ Boneless Shoulder Pot-Roast or Steak
④ Cross Rib Pot-Roast
① Beef for Stew
① Ground Beef**
CHUCK
Braise, Cook in Liquid
② Rib Roast
② Rib Steak
② Rib Steak, Boneless
Rib Eye (Delmonico) Roast or Steak
RIB
Roast, Broil, Panbroil, Panfry
Top Loin Steak ①②③
② T-Bone Steak
③ Porterhouse Steak
①②③ Boneless Top Loin Steak
②③ Tenderloin (Filet Mignon) Steak or Roast (also from Sirloin ①)
SHORT LOIN
Roast, Broil, Panbroil, Panfry
① Pin Bone Sirloin Steak
② Flat Bone Sirloin Steak
③ Wedge Bone Sirloin Steak
①②③ Boneless Sirloin Steak
SIRLOIN
Broil, Panbroil, Panfry
① Round Steak
④ Heel of Round
② Top Round Steak*
① Boneless Rump Roast (Rolled)*
③ Bottom Round Roast or Steak*
③ Cubed Steak*
③ Eye of Round*
Ground Beef**
ROUND
Braise, Cook in Liquid
①
②
③
④
FORE SHANK
Braise, Cook in Liquid
① Shank Cross Cuts
② Beef for Stew (also from other cuts)
BRISKET
Braise, Cook in Liquid
③ Fresh Brisket
③ Corned Brisket
SHORT PLATE
Braise, Cook in Liquid
① Short Ribs
①② Skirt Steak Rolls*
①② Beef for Stew (also from other cuts)
Ground Beef**
FLANK
Braise, Cook in Liquid
Ground Beef**
① Flank Steak*
Beef Patties**
① Flank Steak Rolls*
TIP
Braise
④② Tip Steak*
④② Tip Roast*
④② Tip Kabobs*

*May be Roasted, Broiled, Panbroiled or Panfried from high quality beef.
**May be Roasted, (Baked), Broiled, Panbroiled or Panfried

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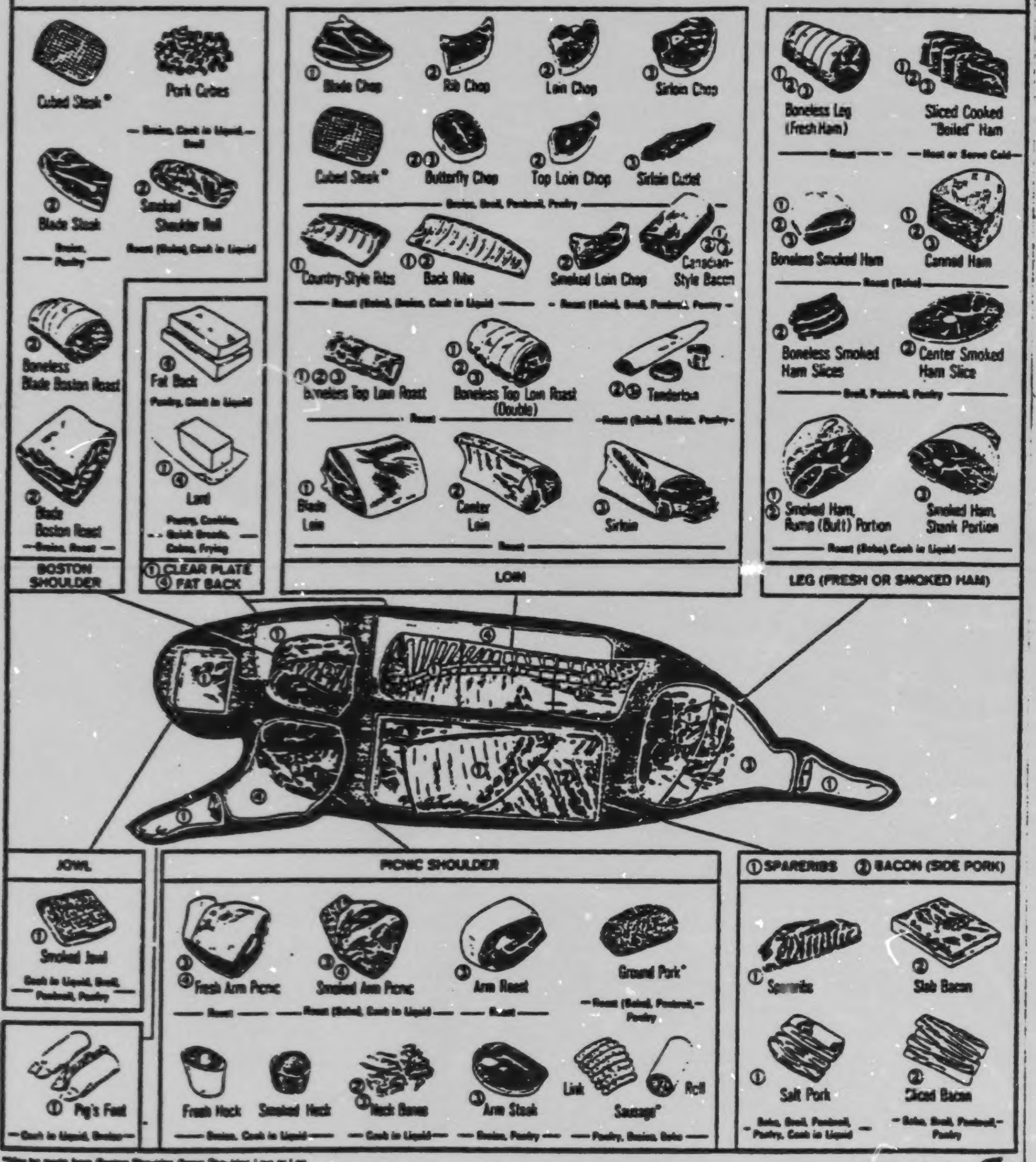
Handout #8-1

PORK CHART

RETAIL CUTS OF PORK — WHERE THEY COME FROM AND HOW TO COOK THEM


Cubed Steak*
Pork Cubes
— Braise, Cook in Liquid —
Broil
② Blade Steak
Braise, Panfry
② Smoked Shoulder Roll
Roast (Bake), Cook in Liquid
② Boneless Blade Boston Roast
② Blade Boston Roast
— Braise, Roast —
BOSTON SHOULDER
④ Fat Back
Panfry, Cook in Liquid
① ④ Lard
Pastry, Cookies, Quick Breads, Cakes, Frying
① CLEAR PLATE
④ FAT BACK
① Blade Chop
② Rib Chop
② Loin Chop
③ Sirloin Chop
Cubed Steak*
②③ Butterfly Chop
② Top Loin Chop
③ Sirloin Cutlet
Braise, Broil, Panbroil, Panfry
① Country-Style Ribs
①② Back Ribs
② Smoked Loin Chop
①②③ Canadian-Style Bacon
Roast (Bake), Braise, Cook in Liquid
Roast (Bake), Broil, Panbroil, Panfry
①②③ Boneless Top Loin Roast
①②③ Boneless Top Loin Roast (Double)
Roast
②③ Tenderloin
Roast (Bake), Braise, Panfry
① Blade Loin
② Center Loin
③ Sirloin
Roast
LOIN
①②③ Boneless Leg (Fresh Ham)
①②③ Sliced Cooked "Boiled" Ham
Roast
Heat or Serve Cold
①②③ Boneless Smoked Ham
①②③ Canned Ham
Roast (Bake)
② Boneless Smoked Ham Slices
② Center Smoked Ham Slice
Broil, Panbroil, Panfry
①② Smoked Ham, Rump (Butt) Portion
③ Smoked Ham, Shank Portion
Roast (Bake), Cook in Liquid
LEG (FRESH OR SMOKED HAM)
①
④
①
①
②
③
①
④
①
JOWL
① Smoked Jowl
Cook in Liquid, Broil, Panbroil, Panfry
① Pig's Feet
Cook in Liquid, Braise
PICNIC SHOULDER
③④ Fresh Arm Picnic
③④ Smoked Arm Picnic
③ Arm Roast
Ground Pork*
Roast
Roast (Bake), Cook in Liquid
Roast
Roast (Bake), Panbroil, Panfry
Fresh Hock
Smoked Hock
②③ Neck Bones
③ Arm Steak
Link
Roll
Sausage*
Braise, Cook in Liquid
Cook in Liquid
Braise, Panfry
Panfry, Braise, Bake
① SPARERIBS
② BACON (SIDE PORK)
① Spareribs
② Slab Bacon
① Salt Pork
② Sliced Bacon
Bake, Broil, Panbroil, Panfry, Cook in Liquid
Bake, Broil, Panbroil, Panfry

*May be made from Boston Shoulder, Picnic Shoulder, Loin or Leg.

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Handout #8-2

TIME AND TEMPERATURES FOR ROASTING MEATS AND POULTRY

CUT	Approx. Wt. of Single Piece (lbs)	Oven Temperature (°F)	Interior Temperature When Removed from Oven (°F)	Minutes Per lb Based on One Piece	Approx. Total Time Roasting
I. BEEF					
Standing Rib (7 ribs)	20 to 25	250	125 (rare) 140 (medium) 150 (well)	13 15 17	4½ hr. 5 hr. 6 hr.
Standing rib (7-ribs)	23	300	125 (rare 140 (medium) 150 (well)	11 12 13	4 hr. 4½ hr. 5 hr.
Rolled rib (7-ribs)	16 to 18	250	150 (well)	26	7 to 8 hr.
Rolled rib (7 ribs)	17	300	150 (well)	24	6 hr
Rump	5 to 7	300	150 to 170	25 to 30	2½ to 3½ hr.
Round (rump and shank off)	50	250	140 (medium) 154 (well	12 14	10 hr. 11 to 12 hr.

CUT	Approx. Wt. of Single Piece (lbs)	Oven Temperaature (°F)	Interior Temperature When Removed from Oven (°F)	Minutes Per lb Based on One Piece	Approx. Total Time Roasting
II. FRESH PORK					
Loin (bone in)	12 to 15	300	165	16	3 to 4 hr.
Loin (bone in)	11 to 15	350	165	15 to 18	3 to 3½ hr.
Half-loin (bone in)		300	165		6 hr.
Half-loin (bone in)		350	165		4½ hr.
Center cut loin	3 to 4	350	165	35 to 40	2 to 2½ hr.
End cut loin	3 to 4	350	165	45 to 50	2½ to 3 hr.
Shoulder	12 to 14	350	165	30 to 35	6½ hr.

CUT	Approx. Wt. of Single Piece (lb)	Oven Temper-ature (°F)	Interior Temperature When Removed from Oven (°F)	Minutes Per lb Based on One Piece	Approx. Total Time Roasting
Rolled Shoulder	4 to 6	350	165	35 to 40	3 to 3½ hr.
Boston Butt	4 to 6	350	165	45 to 50	3½ to 4½ hr.
Ham (leg)	15	300	165	30	8 hr.
Ham (leg)	10 to 12	350	165	30 to 35	6 hr.
III. SMOKED PORK					
Whole Ham	10 to 14	300	155	15 to 18	3 to 3½ hr.
Half Ham	6 to 10	300	155	20	2 to 3½ hr.
Shoulder Butt	2 to 4	300	155	30 to 35	1 to 2 hr.

CUT	Approx. Wt. of Single Piece (lb)	Oven Temperature (°F)	Interior Temperature When Removed from Oven (°F)	Minutes Per lb Based On One Piece	Approx. Total Time Roasting
Picnic	3 to 10	300	155	30 to 35	2 to 5 hr.
IV. POULTRY					
	1½ to 2½		165 min.	35 to 40	1 to 1 3/4 hr.
	2½ to 3½		165 min.	30 to 40	1½ to 2½ hr.
	3½ to 4 3/4		165 min.	30 to 40	2 to 3 hr.
	4 3/4 to 6		165 min.	30 to 40	3 to 3½ hr.
	6 to 8		165 min.	30 to 40	3½ to 4 hr.
	8 to 10 (unstuffed)		165 min.	25 to 30	3 to 3½ hr.

CUTS	Approx. Wt. of Single Piece (lb)	Interior Temperature When Removed From Oven (°F)	Minutes Per lb Based On One Piece	Approx. Total Time Roasting
Poultry	10 to (unstuffed) 14	165 min.	18 to 20	3½ to 4 hr.
	14 to (unstuffed) 18	165 min.	15 to 18	4 to 4½ hr.
	18 to (unstuffed) 30	165 min.	12 to 15	5 to 6 hr.

FOOD EVALUATION FORM

Handout #8-3

This is a general food evaluation form that can be used to judge the quality of any food category. Using a possible ten points for each quality trait listed, determine a numerical rating for each food product judged. When a trait does not apply, give it a score of 10 but circle it. An example of this might be the trait of "proper portion" if you are doing your evaluation in the kitchen prior to portioning or serving the product. This is a good form to use with cooks on a daily basis to get them to think critically of the products they make and where they can be improved.

	1	2	3			4	5	6	7	8	9	10	
Items Prepared and Evaluated	General Appearance Appetizing 10	Proper Portion 10	Temperature			Flavor 10	Texture 10	Color 10	Consistency Std. Sizes No Lumps 10	Aroma 10	Size & Shape 10	Edibility Easy to Eat 10	Total Score Possible 100
			Proper	Actual	Score 10								
												257	
	256												

Handout #8-4

GUIDELINES FOR PROPER DEEP-FRYING

The materials on this handout and the related attached exercises may be included in this lesson if participants have deep-frying equipment and are interested in how to deep-fry properly.

LESSON CONTENT FOR INSTRUCTOR

I. Understanding the nature of frying fats, how they break down and chemically change during use is important in achieving quality fried foods for customers.

  A. When frying, try to keep the fat in top condition to prevent the development of undesirable flavors and a poorly fried end-product.

    1. Fats do not boil away as does water.

    2. Instead, at certain temperatures, or when subjected to certain conditions, they break down.

      a. Normally a good frying fat can be heated to nearly 450°F without breaking down.

      b. Fat will burst into flame at around 600°F.

      c. Fat breakdown from heat is indicated by a white smoke curling up from the surface of the fat which irritates the eyes, nose and throat.

    3. Certain fats are manufactured to resist breakdown and only these should be used in the deep-fryer. Never substitute a fat that is not labeled "For Deep-Frying".

4. Certain metals encourage fat breakdown; among these are copper, brass and iron.
    a. Watch for exposed iron on old frying baskets or other equipment.
    b. Keep iron tools out of the fat, if possible.
5. Curing salts or cooking salt break down fats.
    a. Do not salt foods over the fryer.
    b. Do not deep fry cured meats such as bacon.
6. Water encourages fat breakdown so food should be as dry as possible when put into the fat.
7. Sediment in the fat or unclean equipment can also break fat down.

B. Certain conditions help a fat retain its freshness and good qualities.

1. Rancidity is a chemical change that occurs in fats with exposure to oxygen.
2. Storing fats in a cool, dark area helps reduce rancidity.
3. Exposure to air or light favors rancidity development.
4. Use fat as soon as possible after opening and store covered.
5. Rancid fat develops a soft, yellowish foam and should be discarded.

C. A good, fresh fat is required for all deep-frying.

  1. A fresh fat has white bubbles that break sharply.

  2. If handled correctly, a good fat should seldom have to be discarded or replaced.

  3. If from 15 to 20% of the fat is used each time the fryer is used, enough fresh fat is added to keep it in good condition. Replacing fat as it is used this way is called "turnover".

  4. All foods deep-fried absorb a certain amount of fat while in the fryer.

    a. A fry kettle holding 15 lbs of fat should use 2½ to 3 lbs of new fat after being used, to have proper fat turnover.

    b. If a 15-lb fryer fries 25 lbs of potatoes, or 20 lbs of batter-covered or breaded food items, or 12 dozen doughnuts, the fat turnover requirement should be met easily.

  5. Fats should be strained as frequently as sediment or other products accumulate in it.

II. Good deep-frying techniques are simple but important.

A. Do not under- or over-fill the fryer kettle with fat. Refill with clean fat as the level falls.

B. The accuracy of thermostats on a deep-fryer should be checked by using a thermometer to see if the fat temperature is the same as that set on the dial.

C. Prior to putting food in the fryer, the temperature of the fat must be correct.

1. Cold fat colors food poorly and gives a greasy, soggy product.

2. Too hot a fat burns the food without properly cooking the inside.

D. Food pieces of the same size and kind should be cooked together to obtain uniform cooking and browning.

E. Do not overload the fryer basket; loosely filled baskets about $^3/4$ full will usually fry correctly.

1. Overloading drops the temperature of the fat so low that excessive fat absorption occurs and a poorly cooked product results.

2. Overloading also increases fat consumption and fat costs.

F. Lower the basket carefully into the fat to avoid spillover.

G. Shake the basket occasionally during frying to prevent foods from sticking together.

H. The fat should completely cover the food in the basket.

I. Fry until golden brown, then lift the basket to drain.

J. Spill contents into a pan or place on absorbent paper.

K. Serve the foods hot by serving immediately or keeping it in a dry, warm place or under an infra-red heat lamp.

L. If required, salt foods just before serving since salting destroys crispness. Eliminating the salting step is preferred in all Child Nutrition Programs.

III. The frying of foods can be dangerous to cooks if proper safety precautions are not followed.

A. Fat is highly combustible and a grease fire can be very dangerous.

B. Never overheat fats or allow them to come in contact with open flames.

C. Keep handles of utensils containing hot fat inward when in use.

D. Lower wet foods into fat carefully. Fat can give terrible burns and care should be used in handling it.

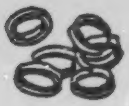
E. To remove sediment, cook fat to below 200°F. Use several thicknesses of cheesecloth, a special filter bag or a filtering machine.

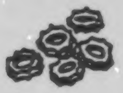
CLASS ACTIVITY

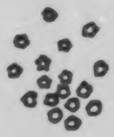
1. Distribute Problems, Causes and Correction In Deep-Frying, and discuss the contents with participants.
2. If a deep fryer (or fryers) is available, set one at 325°F and another at 365°F. Fry a batch of french fries in each fryer and compare the results.
3. Some manufacturers of frying fats have excellent training films available on proper frying techniques. Check with your supplier of fats and shortening to see if such films might be available for viewing by class participants.

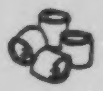
MACARONI PRODUCTS

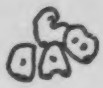
Handout #8-5

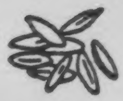

spaghetti rings


spaghetti stars


pastina


salad macaroni


alphabets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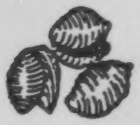
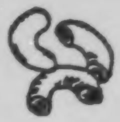
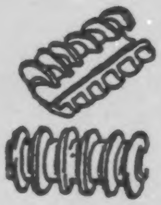
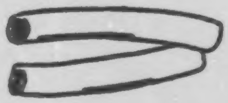
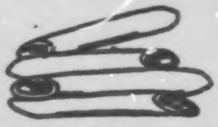

shell (large&small)

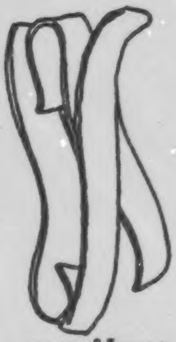

elbow macaroni

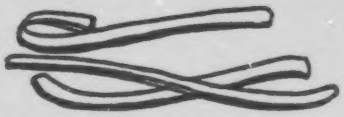

space noodles

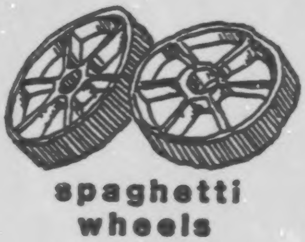

cut macaroni

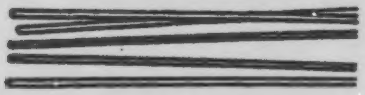
rigatoni


mostaccoli

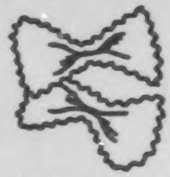

medium noodles

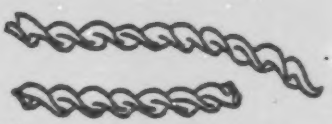

fine noodles


spaghetti wheels


5-minute spaghetti

vermicelli (thinner than spaghetti)


bow-tie noodles


twisted noodles

Handout #8-6

CHEESE, FRANKFURTERS AND RICE

6.7 oz			Main Dish-Cheese 8-6
INGREDIENTS	**AMOUNT (50 servings)**		**PROCEDURE**
Frankfurters, sliced Tomatoes, canned Onions, chopped Garlic, minced Green Pepper, chopped Cheddar Cheese, grated Rice, cooked Salt	4 lbs, 8 oz 6 lbs 1 lb, 8 oz 2 cloves 12 oz 2 lbs, 4 oz 6 lbs 3/4 oz		Combine ingredients and pour into greased serving pans.
			Cover and bake at 375°F for 1 hour. Remove lid and continue baking until lightly browned and vegetables are tender.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

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Handout #8-7

CALCUTTA RICE

6 oz Main Dish--Cheese 8-7

INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Rice, uncooked	1 lb, 12 oz		Cook rice until tender in 7 qts boiling water with 5 Tbsp salt. Wash and drain.
Tomatoes, canned Cheese, grated Onions, chopped Celery, diced Green Pepper, chopped Salt Pepper	6 lbs 2 lbs, 8 oz 1 lb 1 lb, 4 oz 2 lbs 1 oz 1½ tsp		Combine rice with remaining ingredients. Divide into 2 greased pans (12x20x2-inches). Bake at 350°F for 1 hour or until vegetables are tender.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #8-8

SPANISH NOODLES

6 oz			Main Dish-Ground Beef 8-8
INGREDIENTS	**AMOUNT (60 servings)**		**PROCEDURE**
Beef, cubed Green Pepper, chopped Onions, chopped Shortening	6 lbs 1 lb 2 lbs 4 oz		Lightly brown beef in shortening. Add green peper and onions and sauté until vegetables are tender.
Noodles, uncooked	2 lbs, 8 oz		Cook noodles in 6 qts boiling water with 4 Tbsp salt. Wash and drain.
Celery, chopped	1 lb		Cook celery in water until tender. Drain.
Tomato soup Water Salt Pepper	4 lbs 1 lb, 8 oz 1 oz 1 tsp		Combine all ingredients
			Divide into 2 greased pans (12x20-x2-inch). Bake at 350°F for 20 minutes or until browned.

Cost per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #8-9

MEAT LOAF (COMBINED MEATS)

1 slice—4 oz			Main Dish—Ground Beef 8-9
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Ground Beef Veal or Turkey, ground Pork, ground Salt Pork or Bacon, ground Beef stock Eggs, well-beaten Onions, chopped Salt Pepper Bread crumbs	4 lbs 2 lbs 1 lb 1 lb 1 lb 10¼ oz 1 lb 1 ^{2}/3 oz 1 tsp 12 oz		Blend all ingredients together well.
			Press 2 lbs into each of 3 greased load pans (5x9x3-inch). Bake at 350°F for 1 hour or until done.

Cost Per Serving: ____________________

Total Production Time: ________________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

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Handout #8-9a

MEAT LOAF (WITH 20% TEXTURED VEGETABLE PROTEIN)

1 slice--4 oz			Main Dish--Ground Beef 8-9a
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Water, hot Beef soup base Textured Vegetable Protein	1 lb, 4 oz ½ oz 15 oz		Dissolve soup base in hot water. Cool. Stir in textured vegetable protein. Let stand 15 minutes.
Bread, sliced Milk	1 lb 1 lb, 8 oz		Soak bread in milk and blend in mixer at low speed.
Onions, chopped Celery, chopped Ground Beef Salt Worcestershire Sauce Pepper Eggs, beaten	8 oz 4 oz 5 lbs, 8 oz 1 oz 1 oz 1 tsp 11 oz		Combine all ingredients and continue mixing at low speed for 3 or 4 minutes. Divide into 2 greased pans (12x20x2-inch). Mold into loaves (2) lengthwise in each pan. Bake at 350°F for 1½ hours. Drain. Slice 3/4-inch thick.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #8-10

SPANISH MEAT LOAF

1 slice--4 oz			Main Dish--Ground Beef 8-10
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Bacon fat Flour Milk Salt Pepper	8 oz 6 oz 1 lb, 8 oz 2 oz 1 tsp		Make a thick white sauce with bacon fat, flour, milk, salt and pepper.
Ground beef Oatmeal, uncooked Tomato Puree Eggs, beaten Bread crumbs Celery, finely chopped Onions, finely chopped Green pepper, finely chopped	7 lbs 8 oz 2 lbs 7 oz 8 oz 12 oz 1 lb 8 oz		Combine all ingredients and mix well. Scale $4\frac{3}{4}$ lbs into each of 3 greased loaf pans (9x5x3-in) or divide into 2 serving pans. Bake at 350°F for 1 hour or until done.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

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Handout #8-11

MOCK DRUMSTICKS

#16 scoop (2 drumsticks)		Main Dish--Poultry	8-11
INGREDIENTS	**AMOUNT (50 servings)**	**PROCEDURE**	
Ground beef	6 lbs	Combine all ingredients and mix well. Shape into drumsticks on skewers, using a #16 scoop (100 drumsticks).	
Ground Veal or Turkey	6 lbs		
Stock	1 lb, 4 oz		
Eggs, beaten	10 oz		
Salt	2 oz		
Pepper	1 3/4 oz		
Ground sage or Poultry Seasonings	½ tsp		
Onions, finely chopped	1 lb, 4 oz		
Bread crumbs	10 oz	Roll in 1½ lbs bread crumbs. Sauté in fat until brown. Arrange in baking pan. Add 1 qt boiling water. Cover and bake at 300°F for 1 hour.	

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #8-12

TURKEY TAMALE PIE

6 oz			Main Dish--Poultry 8-12
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Turkey or chicken stock Salt Corn Meal, Yellow	4½ qts 1½ oz 2 lbs		Heat stock to boiling. Add salt and slowly stir in corn meal. Cook until thick, stirring constantly.
Onions, minced Garlic, minced Bacon or Salt Pork	2 lbs 3/4 oz 12 oz		Sauté onions, garlic and pork until lightly browned.
Salad oil Tomatoes, canned Corn, whole kernel Chili powder Paprika Pepper	12 oz 3 lbs 3 lbs 2/3 oz 1 Tbsp 1½ tsp		Stir in vegetables and seasonings. Combine with corn meal.

Handout #8-12/Page 2

INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Eggs, beaten Turkey, cooked, diced	1 lb, 8 oz 4 lbs		Fold in eggs and turkey.
			Divide into 2 greased serving pans (12x20x2-in). Bake at 350°F for 1 hour.
Cheddar Cheese, grated	12 oz		Sprinkle cheese evenly over top of tamale pies and return to oven for 15 minutes, for the cheese to melt.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #8-13

LASAGNA

6 oz			Main Dish--Cheese 8-13
INGREDIENTS	**AMOUNT**		**PROCEDURE**
Ground beef Onion, finely chopped Garlic, chopped	5 lb 12 oz 5 cloves		Cook ground beef, onion and garlic until pink color has disappeared. Drain off excess fat.
Tomato sauce Tomato paste Pepper Basil, crumbled Oregano, crumbled	3 qt 1 qt 1 tsp 1 tsp 1 Tbsp		Add tomato sauce, tomato paste, and spices to meat. Continue cooking, about 30 minutes, stirring occasionally.
Noodles, lasagna Water, boiling Salt Oil	2 lb, 8 oz 2 gal 2 Tbsp 2 Tbsp		Cook noodles. Hold in cold water to keep noodles from sticking together. Drain when ready to use.
Swiss or mozzarella cheese, grated Parmesan cheese, grated Cottage cheese, dry or drained	2 lb, 8 oz 6 oz 2 lb, 8 oz		Combine cheeses. Arrange in 2 counter pans (12x20x2-in) in layers in the following order: Meat sauce (1 qt), noodles overlapping (1 lb 12 oz), cheeses (1 lb 4 oz). Repeat sauce, noodles and cheeses. Spoon remainder of meat sauce on top. Bake at 350°F for 40-45 minutes.

SEE PAGE TWO FOR VARIATIONS

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LASAGNA VARIATIONS

MEATLESS CHEESE LASAGNA:	Omit beef. Add 2 lb sliced American cheese, arranged in layers over noodles. Increase cottage cheese to 4 lb.
SPINACH LASAGNA:	Omit beef. Increase cottage cheese (or ricotta cheese) to 5 lb. Defrost 6 lb frozen chopped spinach. Drain and squeeze out excess liquid. Combine with cottage cheese and Parmesan cheese. Arrange noodles and spinach-cheese mixture in layers. Pour tomato mixture over and sprinkle with mozzarella cheese.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F. Food for Fifty, 1979, 6th Edition. John Wiley and Sons, New York, New York.

Handout #8-14

DEVILED PORK CHOPS

1 chop - 5 to 5½ oz			Main Dish--Meats 8-14
INGREDIENTS	AMOUNT		PROCEDURE
	50 serv.		
Chili Sauce Mustard, dry Worcestershire Sauce Lemon Juice Onion Juice	6 lbs 1 tsp 1½ oz 1½ oz 1 tsp		Combine chili sauce, mustard, Worcestershire sauce, lemon and onion juice. Mix thoroughly.
Pork Chops Salt Pepper	17 lbs 3/4 oz ½ tsp		Dip each chop into sauce and place in one layer in serving pan. Sprinkle with salt and pepper. Let stand for 30 minutes. Cover and bake at 350°F for 2½ to 3 hours or until tender.

Cost Per Serving:____________________

Total Production Time:_________________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

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LESSON 9 : FISH, EGGS, CHEESE AND MILK COOKERY

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic techniques for preparing various types of fish, eggs, cheese and milk products.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. Identify the available varieties of fish, eggs, cheese, and milk;
2. Describe the proper storage procedures for fish, eggs, cheese, and milk products;
3. Describe and demonstrate proper fish cookery methods;
4. Describe and demonstrate proper egg cookery;
5. Describe and demonstrate proper cheese and milk cookery;
6. Describe and demonstrate proper breading procedures.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.

2. Locate a chalk board for use in the classroom.

3. Arrange for use of a quantity kitchen for participants to use, and arrange for the purchase of ingredients needed to prepare sample recipes included in this lesson. If a kitchen is not available, arrange for sample products to be prepared in advance for participants to evaluate, using the evaluation form included as Handout #9-5.

D. KEY WORDS USED IN THIS LESSON

COMPARTMENT STEAMER: the traditional stacked double or triple chamber steamer which cooks foods under pressure.

CURDS: the protein in milk when coagulated.

WHEY: the watery liquid remaining after milk protein (curd) has coagulated.

DREDGE: to pass a product through a fine, dry or powdery substance such as flour, cornmeal or other food to coat it lightly.

BAIN MARIE: vat of hot water kept at approximately 180°F for holding hot liquids, such as soups or sauces, in readiness for service.

EVISCERATED: entrails have been taken out.

LESSON 9 : FISH, EGGS, CHEESE AND MILK COOKERY

SHELLFISH: fish with shells, as opposed to fin fish; includes clams, crabs, lobsters, oysters, scallops, and shrimp.

RECONSTITUTE: to restore a product to its normal state, such as adding liquid to a dried product, or reheating a sauce which has been frozen or refrigerated.

CLARIFIED BUTTER: butter that is melted and the clear oil removed from the milky residue at the bottom.

SHELF LIFE: the length of time a food can be stored without being a health hazard or losing quality.

FLESH PIGMENT: the coloring found in tissue or muscle.

DOUBLE-BOILER: two pans that nest tightly, with water in the bottom pan; provides indirect heat for food products requiring gentle cooking, such as milk or cheese.

E. REFERENCES FOR ADDITIONAL INFORMATION

Blair, Eulalia C. Casseroles and Vegetables for Foodservice Menu Planning, 1976. Cahners Books, CBI Publishing Inc., Boston, MA.

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LESSON 9 : FISH, EGGS, CHEESE AND MILK COOKERY

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Kotschevar, Lendal H. *Quantity Food Purchasing*, 1975. John Wiley and Sons, Inc., New York, New York.

Mizer, David A., and Porter, Mary. *Food Preparation for the Professional*, 1978. Canfield Press, San Francisco, CA. A department of Harper & Row, Publishers.

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LESSON 9 : FISH, EGGS, CHEESE AND MILK COOKERY

LESSON CONTENT

CLASS ACTIVITY

I. FISH, EGGS, CHEESE AND MILK ARE PROTEIN FOODS THAT REQUIRE GENTLE HEAT DURING COOKING TO PRODUCE AN ACCEPTABLE FINISHED PRODUCT.

A. All of These Foods Are Used in a Variety of Ways in Child Nutrition Programs, Usually In Combination With Other Ingredients.

B. In Cooking, All of These Foods Require:

1. Controlled heating conditions;

2. Specific preparation instructions followed;

3. Close attention to avoid overcooking.

II. FISH FLESH IS SIMILAR TO MEAT AND POULTRY EXCEPT THAT IT CONTAINS LITTLE CONNECTIVE TISSUE AND NO FLESH PIGMENT THAT CHANGES COLOR DURING COOKING.

A. Selection and Varieties of Fish

1. Numerous varieties of fish and shellfish can be purchased fresh, frozen and canned.

a. High quality frozen fish should:

(1) be firm and elastic to the touch;

(2) have a bright and shiny appearance;

(3) have little odor.

LESSON CONTENT	CLASS ACTIVITY
b. High quality frozen fish should: (1) be bright in appearance; (2) be sweet smelling and solidly frozen; (3) have no brownish tinge or fishy odor. c. High quality canned fish should: (1) be neatly packed with firm texture; (2) have the color of the flesh and liquid clear, and typical; (3) have a flavor and odor that is pleasant and free from rancidity. 2. The market forms of fin fish available include whole or round, drawn, dressed, steaks, fillets and sticks. a. Due to a limitation in labor hours, many foodservice operations seldom purchase whole or drawn fish. b. Child Nutrition Programs generally use fish steaks, fillets or sticks.	Distribute Handout #9-1, and briefly review the differences in the various market forms of fin fish available.

LESSON CONTENT	CLASS ACTIVITY

3. A discussion of shellfish is not included in this lesson because of its limited use in Child Nutrition Programs. Additional information on this subject is available in:

    a. Professional Food Preparation, by Margaret E. Terrell

    b. Standards, Principles and Techniques in Quantity Food Production, by Lendal H. Kotschevar.

B. Storage and Handling of Fish

1. Fish is a fragile food in terms of spoilage.

    a. Wrapping fish in plastic bags or other moisture-proof wrappings, and packing it in ice is highly desirable.

        (1) It protects the fish from dehydration, oxidation and the absorption of off-flavors.

        (2) When fish are exposed to the air, oxidation that causes rancidity occurs.

LESSON CONTENT	CLASS ACTIVITY

(3) This increases the development of off-odors and spoils the flavor.

b. Fresh or thawed fish should be refrigerated at 23° to 30°F which requires the use of crushed ice on the product while being held in a refrigerator set at 40°F or less.

c. Frozen fish should be kept wrapped and held at 0°F or lower and not allowed to thaw until time for use.

(1) When thawing frozen fish, thaw it just to a condition that permits ease of preparation and cooking.

(2) Cooking may be done from the frozen state if adequate allowance is made in the cooking time.

C. Fish Cookery

1. The best method of preparation for fish depends on the characteristics of the specific fish, with the amount of fat in fish dictating the method of cooking.

a. Marbling of fat is not present in fish as it is in meats; the fat is spread as an oil throughout the tissues.

LESSON CONTENT	CLASS ACTIVITY

b. Fat fish, such as salmon, mackerel and trout, are usually baked, broiled, simmered or poached.

c. Lean fish, such as flounder, halibut and cod, have a dry meat when cooked, so these fish are usually sautéed, poached or simmered to give them moistness.

d. Both lean and fat fish deep-fry well, but as a rule, lean fish make a better deep-fried product.

2. In Child Nutrition Programs, fish is seldom broiled, poached or baked, so these preparation methods will not be discussed in this lesson. Additional information on these methods of cookery are available in the references noted in II. A. 3, above.

3. Deep-frying or pan frying are preparation methods that may be popular in Child Nutrition Programs and will be discussed in more detail.

a. Pan-frying or sautéing of fish can be done on the top of a range, in a tilting fry pan, or on baking sheet pans in the oven.

LESSON CONTENT	CLASS ACTIVITY
(1) Use clarified butter or margarine, or mild-flavored cooking fat, and a low cooking temperature for this method of preparation.	
(2) Coat fish lightly with flour, bread or batter. (3) Cook fish just until fork tender. (4) Serve this product as soon as possible, since part of its quality depends upon a crisp outer layer and a fresh, moist inside.	Distribute Handout #9-2, and review together the step recommended in the breading and battering process. If possible, demonstrate these procedures for the class.
(5) Stagger preparation of this product throughout the meal period so as to provide freshly prepared fish portions to all customers.	
b. Deep-frying is a preparation method often used for fish, as is evidenced by its frequent appearance on menues.	
(1) The techniques and details of deep-frying are outlined in Handout #8-16, from Lesson 8--Meat, Poultry and Starch Cookery. It should be	

(1) ...reviewed at this time if class participants request this information or if they did not cover this information during Lesson 8.

(2) Many convenience fish items are available.

  (a) They are already batter-dipped or breaded.

  (b) They require little handling except final cooking.

  (c) Cooking times for these items are usually noted on the package labels and should be followed carefully.

(3) Some foodservice operations prefer to buy fish fillets or sticks and bread, flour or batter-dip the product themselves.

LESSON CONTENT	CLASS ACTIVITY
(4) Most fish products can be deep-fried at 350°F using the time approximations listed below: Fresh fish fillets--3 minutes Frozen fish fillets--4 minutes Frozen fish sticks--4 minutes (5) If more than one deep-fried item is being prepared at the same time, it is recommended that fish items be fried in one fryer. (a) Other foods such as french fries should be fried in another fryer if possible. (b) This prevents the possible transfer of flavors that may produce fishy-tasting french fries. III. EGG COOKERY IS NOT SIMPLE AND DEPENDS UPON THE HIGH QUALITY OF THE PURCHASED EGGS TO PRODUCE A FINAL PRODUCT THAT MEETS ACCEPTABLE STANDARDS. A. Selection and Varieties of Eggs	

LESSON CONTENT

1. Fresh eggs in the shell are graded for quality and for size.
   a. The three USDA quality grades for fresh eggs are:
      (1) U.S. Grade AA or Fresh Fancy Quality
      (2) U.S. Grade A
      (3) U.S. Grade B
   b. The six USDA size grades and the weights per dozen for fresh shell eggs are:
      (1) Jumbo--30 ounces
      (2) Extra large--27 ounces
      (3) Large--24 ounces
      (4) Medium--21 ounces
      (5) Small--18 ounces
      (6) Peewee--15 ounces

CLASS ACTIVITY

Distribute Handout #9-3, and review together how to compare the prices of various sizes of eggs.
Ask class participants to complete the problems at the end of the handout individually. Share answers and discuss how each problem was solved.

LESSON CONTENT	CLASS ACTIVITY

c. Only a high quality grade of egg should be used for most breakfast menu items, but eggs of lesser quality can be used successfully in mixtures such as scrambled eggs or for baking.

2. Shelled eggs or egg meats may be purchased fresh but usually are frozen.

   a. These are available as whole eggs, white or yolks, and can be used in recipes in the same manner as fresh eggs.

   b. These products are usually marketed in 30-pound cans or 10-pound cartons.

3. Cooked shelled eggs may be purchased in a frozen or fresh form.

   a. Hard-cooked shelled eggs are available fresh in 20-pound packages, and have a 4-week shelf life under refrigeration.

   b. Hard-cooked chopped eggs are available frozen in 20-pound boxes and are suitable for addition to salads and other mixtures.

LESSON CONTENT	CLASS ACTIVITY
c. Pre-cooked, portioned scrambled eggs are available frozen, 225 portions per case. Each portion is equal to one large egg and can be heated in an oven for service. 4. Dried eggs are available as whole egg solids, egg white solids, and egg yolk solids. a. The USDA recommends the use of dried eggs only in foods that are thoroughly cooked; they can be used successfully in baked goods. b. When reconstituting dried eggs, spread the egg solids slowly into lukewarm water, stirring constantly with a wire whip or mixer. (1) Allow to stand a few minutes before using them, and then stir again. (2) This allows the solid egg material to absorb the water more fully. B. Storage and Handling of Eggs 1. Store fresh eggs in covered containers away from strong, odorous food.	

LESSON CONTENT	CLASS ACTIVITY

a. Keep them refrigerated, bringing out only those to be used immediately.

b. Do not wash eggs before storage as they naturally possess a film that helps to protect them from spoilage.

c. To keep leftover fresh shelled eggs, cover tightly to prevent drying.

d. Cracked eggs should be used as soon as possible and not be held more than 2 days.

2. Store shelled eggs or egg meats either frozen or under refrigeration, as required.

3. Store cooked shelled eggs either frozen or under refrigeration, as required.

4. Store dried eggs at low temperatures since changes in flavor, color, odor and solubility occur when they are held at temperatures above 40°F.

C. Egg Cookery

1. Eggs possess properties that make them useful in many ways in the preparation of food. They are used as:

LESSON CONTENT	CLASS ACTIVITY
a. thickening agents in many puddings and sauces; b. emulsifying agents in mayonnaise; c. binder in meat loaf or croquettes; d. coating on foods that are breaded; e. leavening agent for batters and soufflés; f. garnish when hardcooked and sliced or wedged; g. alone as an important protein dish in meals. 2. Discussion in this lesson will be limited to scrambled eggs and hardcooked eggs since these are likely forms of egg cookery found in Child Nutrition Programs. a. Scrambled eggs are a form of eggs that are easy to serve to a large group. (1) Eggs of a lower grade than Grade AA may be used.	

LESSON CONTENT	CLASS ACTIVITY
(2) Eggs should be beaten only enough to blend the yolks and whites with the added liquid. (3) Scrambled egg mixtures are available that have the added liquid milk product already combined, ready for cooking. (4) Scrambled eggs used for cafeteria service, or where holding prior to service is required may be improved by adding 1 cup of medium white sauce to a quart of whole eggs as a replacement for the milk liquid. (a) This lessens the firmness and bleeding out that may occur with extended exposure to heat. (b) It also decreases the possibility of "eggs turning green" and helps maintain a bright yellow color. (5) Cooking of scrambled eggs may occur in a: (a) large greased pan in the oven;	

LESSON CONTENT	CLASS ACTIVITY
(b) steam-jacketed kettle; (c) bain marie; (d) tilting frying pan; (e) steam table; (f) skillet or fry pan on the range top; or (g) steamer. b. Hard-cooked eggs are prepared by placing eggs in boiling water for 10 to 12 minutes or in a compartment steamer for about 3 minutes. (1) Have at room temperature or warm them slightly in lukewarm water before hardcooking; if the eggs are cold, they may crack during the cooking process. (2) Cool immediately in cold water for 5 to 10 minutes.	

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LESSON CONTENT	CLASS ACTIVITY

(3) Peel immediately, cracking the shell well and rolling it to give good shell break-up.

  (a) Start at the large end of the egg and peel down.

  (b) Use running water, if necessary, to help loosen the shell from the egg.

(4) If to be chopped, crack eggs into lightly greased pans not over an inch deep, steam or bake them, and then chop.

(5) The green ring sometimes found around the outer edge of the cooked yolk of a hard-cooked egg is iron sulfide which has a strong flavor and an undesirable color. To decrease development of this green ring:

  (a) cook at lower temperatures;

  (b) use fresh eggs;

LESSON CONTENT	CLASS ACTIVITY
(c) shorten the cooking time; and (d) rapidly cool the cooked eggs. 3. Additional details on egg preparation such as fried eggs, omelets, soufflés, poached eggs, and egg foams are discussed at length in the references cited in section II. A. 3, above. IV. CHEESE IS A HIGH-PROTEIN DAIRY PRODUCT MADE FROM THE MILK OF COWS, SHEEP AND GOATS. A. Selection and Varieties of Cheese 1. Natural cheeses can be classified by hardness or by the ripening process used during cheese production. a. Hardness is influenced by the degree of cooking that occurs during its manufacture and includes the following classifications: (1) soft; (2) semi-hard; (3) hard.	

LESSON CONTENT	CLASS ACTIVITY
b. Ripening classifications include: (1) unripened; (2) bacteria ripened; (3) mold ripened.	Distribute Handout #9-4, and review the classifications of natural cheeses listed.
2. Processed cheeses are now available in a variety of types and flavors. a. These are natural cheeses that have been pasteurized to stop bacterial action and further aging of the cheese. b. Emulsifiers may be added to give a smooth end product. c. Because of the pasteurization and emulsifiers, this cheese combines more easily with other foods than natural cheeses, and makes an end product that is more stable when held under heated conditions.	
3. Cheese alternate products have been approved for use by the USDA. Characteristics and requirements of this product include:	

LESSON CONTENT	CLASS ACTIVITY
a. protein quality and quantity the same as natural cheese;	
b. use of conventional ingredients in manufacture;	
c. equivalent to natural cheese in all major nutrients;	
d. being used only as 50 percent or less of the required cheese ingredient, the remainder being natural cheese.	
4. Cheese foods and cheese spreads have also been approved for use in Child Nutrition Programs.	
a. These foods contain certain extenders and other ingredients which decrease the protein level of the product.	
b. Twice as much cheese food or cheese spread must be used to fulfill the meat alternate requirement. For example, 2 ounces of this product would equal only 1 ounce of meat/meat alternate.	
B. Storage and Handling of Cheese	
1. Cheeses are stored under refrigeration.	

LESSON CONTENT

2. Cut or sliced cheese dries and hardens when exposed to air.

    a. Such cheese must be either used immediately or tightly wrapped in plastic film or foil to eliminate air.

    b. If cheese does dry out and get hard due to exposure to air, use it in sauces and cooked products. Do not throw it away.

3. Cheese properly wrapped keeps from a week to a month in the refrigerator, depending on the type of cheese.

C. Cheese Cookery

1. Cheese cookery poses no problems as long as you keep the temperature low or the cooking time short, or both.

    a. The high-protein content of cheese means that it becomes tough and stringy with high temperatures and prolonged cooking.

    b. Its fat content may also separate out.

CLASS ACTIVITY

Bring samples of the following foods to class for participants to taste and identify. Number each sample and ask participants to individually name each cheese and write their answers on a numbered sheet. Discuss each sample together and allow participants to check

LESSON CONTENT

c. Cheese added to a starch-thickened sauce such as cheese sauce, must not be added until after the thickening process is complete.

2. When possible, foods should be prepared so that the cheese ingredient can be added near the end of the cooking period in a manner that does not expose the cheese to direct heat.

   a. Shredding or finely dicing cheese helps it melt faster and blend better with other foods.

   b. Use a double boiler when melting cheese or making cheese sauce.

   c. When used as a topping it is wise to protect it with a generous sprinkling of buttered bread crumbs to prevent overcooking.

3. When cooking with cheese alternate products, preparation methods used are the same as those used with natural cheeses.

CLASS ACTIVITY

their own answers for accuracy.

Samples to Provide:

Swiss, natural
Swiss, processed
American
Parmesan, bulk (not grated)
Cheddar, natural
Cheddar, processed
Muenster
Cottage
Cream
Ricotta
Mozzarella

LESSON CONTENT	CLASS ACTIVITY

V. MILK IS A COMMON FLUID IN WHICH MANY FOODS ARE SUSPENDED OR DISSOLVED IN COOKING.

A. Selection and Varieties of Milk

1. Milks used in cooking may be fresh, canned or dry.

a. Fresh milks may be of two basic types:

(1) whole milk which has 3¼ percent milkfat;

(2) skim or nonfat milk which contains from ½ to 3¼ percent milkfat.

b. Canned concentrated milks may be of three basic types:

(1) evaporated whole milk which has 8% milkfat;

(2) evaporated non-fat milk which has only a trace of milkfat;

(3) sweetened condensed whole milk which has 8.5% milkfat and 42 to 45% sugar.

LESSON CONTENT | CLASS ACTIVITY

c. Dry milk may be of two basic types;

(1) dry whole milk which has 27% milkfat; and

(2) non-fat dry milk which has only a trace of milkfat, usually about 1½ percent.

(3) Both types are available as regular or instant dry milk, with instant being easier to dissolve.

2. Because dry milks cost less they are frequently preferred for cooking and baking.

a. The keeping or holding qualities of dry milks are also better than the fresh product.

b. In many recipes, reconstituted whole or low-fat milk may be directly substituted, producing a very acceptable end product.

B. Storage and Handling of Milk

1. Fresh milks must be stored under refrigeration to maintain quality.

LESSON CONTENT	CLASS ACTIVITY

a. The FIFO (First-In, First-Out) principle of stock rotation should be applied.

b. Most milk products are dated for ease in maintaining fresh stock.

2. Canned concentrated milks may be stored at cool room temperatures but once opened must be stored under refrigeration.

3. Dry milks have a relatively long shelf life.

a. Dry whole milk is more susceptible to rancidity due to its higher milkfat content. It may be wise to store this product under refrigeration.

b. Non-fat dry milk is very stable at cool room temperatures.

c. After being reconstituted, both products should be stored under refrigeration.

C. Milk Cookery

1. Basic principles in milk cookery try to avoid curdling, coagulation and scorching.

LESSON CONTENT

a. Curdling is a process in which the milk protein, casein, separates into curds from the whey.

   (1) Is encouraged by salt compounds and strong acid foods.

   (2) Is encouraged by high heat.

b. Coagulation of milk protein is encouraged by heat.

   (1) The scum on top of heated milk, or the precipitate deposited in utensils in which milk is heated are coagulated milk proteins.

   (2) Scum can be avoided by covering tightly during heating, whipping to create a foam on top, or allowing melted fat to cover the surface during the heating process.

c. Milk scorches easily and should be heated over water in a double-boiler, in a steam-jacketed kettle, or in a steamer.

2. In general, low temperatures are the key to successful milk cookery.

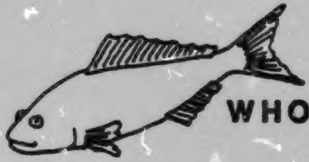
CLASS ACTIVITY

If a preparation kitchen is available divide participants into pairs and assign each couple one of the recipes to prepare on Handouts #9- 7 through 9-13. Use the evaluation form on Handout #9-5 to judge the quality of each product prepared.

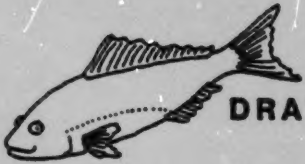
Note to Instructor: See the Instructor's Guide for this activity on Handout #9-6.

Handout #9-1

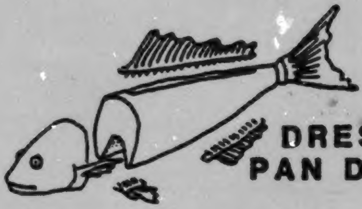
MARKET FORMS of FIN FISH



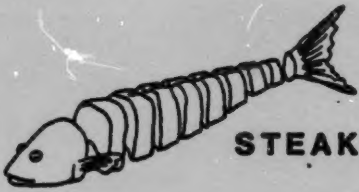
WHOLE or ROUND: As it comes from the water and perhaps scaled.



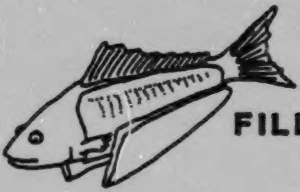
DRAWN: Eviscerated and perhaps scaled.



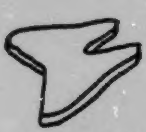
DRESSED or PAN DRERSSED: Scaled and eviscerated; usually head, tail and fins are removed.



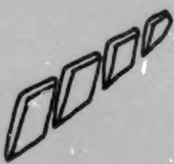
STEAKS: Cross sections or slices of larger sizes of dressed fish.



FILLETS: The flesh on either side of the backbone and over the fish bones of the thoracic or "chest" cavity. The skin may or may not be on.



BUTTERFLY FILLETS: Cross sections or slices of larger sizes of dressed fish.



STICKS: Fillets or steaks in lenghtwise pieces, usually of uniform size.

Handout #9-2

BREADING AND BATTERING FOODS

I. The Breading Process

A. Breading is a 3-step process of coating a product with crumbs or meal.

B. It is applied to a variety of foods, such as meats, vegetables, fish, poultry, and croquettes.

C. Breaded items are usually deep-fried but occasionally they are pan-fried.

D. The "coat" of breading around a product does a number of things.

1. It transmits heat from the fat to the product.
2. It keeps the product from absorbing the fat.
3. It helps the product retain its moisture.
4. It forms a shield that allows the product to be seasoned without harming (breaking down) the fat.
5. It produces a crisp and crunchy texture that contrasts pleasantly with the softness of the product.
6. Properly cooked, it adds its own pleasant taste to complement the taste of the product.

E. The product to be breaded may be seasoned before breading begins since seasoning it after frying has little effect because it does not cling to the product.

1. Seasoning and flavoring are sometimes added to the breading, but they will only season or flavor the breading, and not the product itself.

2. In addition, the seasonings may be harmful to the cooking fat, causing it to break down.

F. There are three essential steps in the breading process which are illustrated on the next page.

  1. Step 1: The food product is first dredged or coated in flour.

  2. Step 2; Then the food is dipped into an egg wash mixture of eggs and liquid. Drain off excess egg wash on a draining rack.

  3. Step 3: Last, dip the food into the crumb or meal and set it on a pan or tray to await final cooking.

G. Breaded items should be placed in single layers on trays or pans so that they do not sweat or become soggy or stick to one another.

  1. If you must stack breaded items, put wax paper between the layers.

  2. If being held prior to cooking, keep in the refrigerator, because the raw eggs in the egg wash are a likely place for bacterial growth.

H. There are problems that frequently occur during the cooking of breaded products.

  1. Problem: The breading may not stick to the food product.

    a. Solutions to this problem include the following steps:

      (1) Dry the excess moisture from the food product so the flour will stick to it readily.

(2) Pass food through the flour, making sure it is completely covered.

  (a) Then, shake off the excess flour.

  (b) This gives a dry, even coat for the wash to stick to.

(3) Dip food in egg wash.

  (a) Again make sure the food is completely covered.

  (b) Drain off excess egg wash.

  (c) This gives a wet, even coat for the crumbs or meal to adhere to.

(4) Put the food product in the crumbs, coat completely and shake off excess.

b. A food product carefully breaded in this fashion will not shed its coat in cooking.

2. Problem: The breading may cook golden brown before the product inside is cooked.

  a. If the product is one that requires more than a short cooking time, precook it prior to breading.

  b. For example, meat in croquettes should be precooked before breading. Chicken may be handled in this manner also.

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3. Problem: The breading may break or crack during frying.

    a. The breading will definitely crack if eggs alone are used in the second step of the breading process.

    b. A good egg wash is a ratio of 2 parts egg to 1 part liquid by volume.

    c. The milk or water that is added to the eggs will eliminate the cracking.

4. Problem: The finished product may have a ragged appearance or have dark spots marring its golden coat.

    a. A uniformly good appearance can be achieved by always using dried crumbs that are very fine. They will adhere evenly and cook evenly.

    b. Toasting or drying bread, crushing it, and running it through a screen makes fine crumbs.

5. Sometimes while breading you may find that your hands are getting as fully breaded as the food product, and that you are getting egg wash in the crumbs, crumbs in the flour.

    a. The solution to this situation is to keep one hand dry for the flour and crumbs, and use the other hand only for the egg wash.

    b. For the right handed worker, the breading process moves from left to right so you would keep your right hand dry.

c. The opposite would be true for a left-handed worker.

d. In spite of good technique, egg wash and crumbs may invade the wrong containers after a period of time.

(1) Sift the flour, strain the egg wash, and sift the crumbs to restore them.

(2) Otherwise, the breading may become full of lumps.

II. The Battering Process

A. Another coating commonly used for foods to be fried is batter.

1. A batter is a semi-liquid; too stiff to be called a liquid and too fluid to be called a solid.

2. It is often used with chicken, fish and vegetables.

3. It usually consists of an egg-and-liquid mixture thickened with flour to achieve a smooth, rich consistency.

4. Many variations of the basic batter are used.

a. Cornstarch is often added to give a crisp and shiny finish coat.

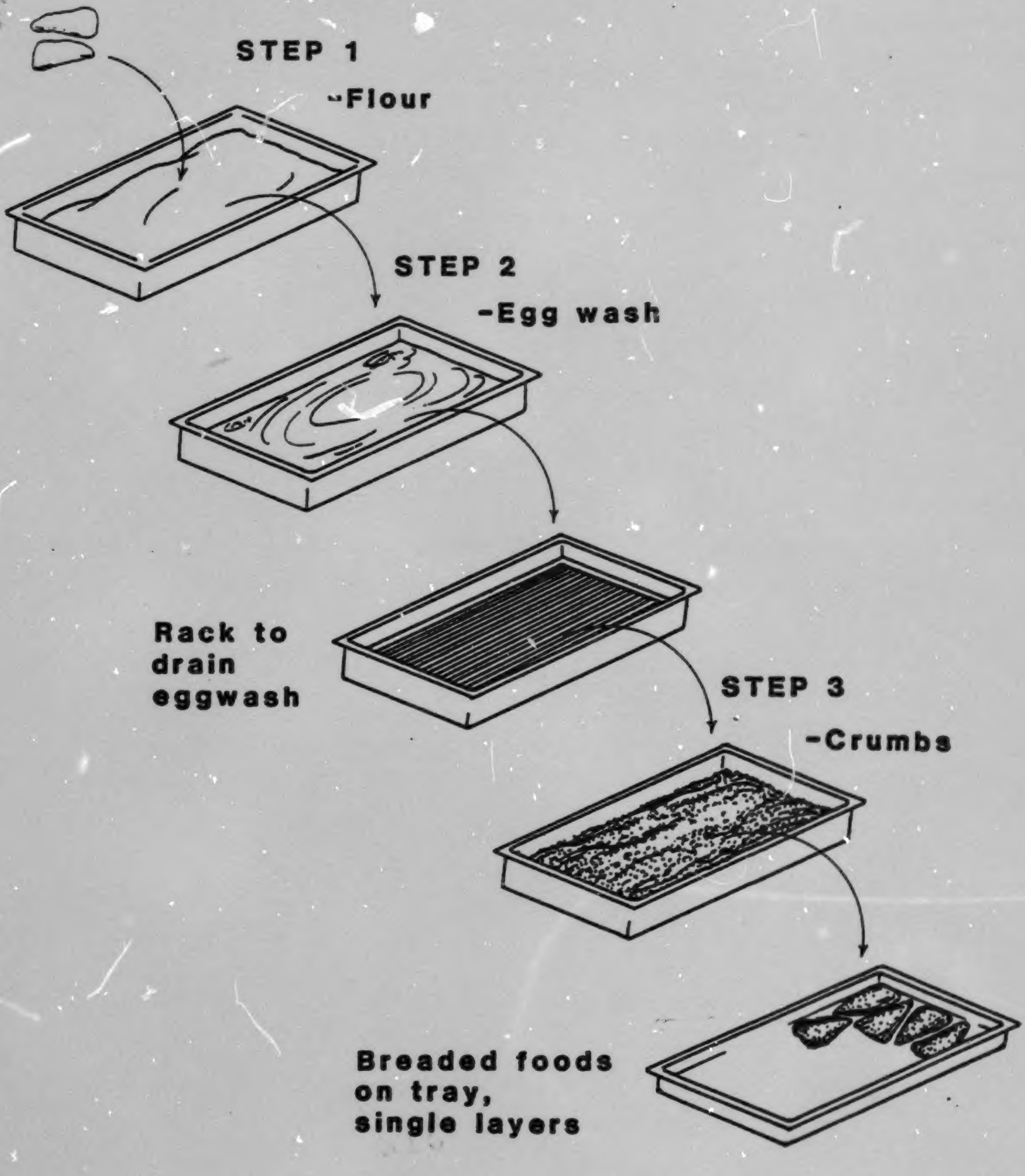
b. Some batters use baking powder for a lighter product.

c. In some, the egg whites are beaten separately, then folded in for an aerated batter.

Handout #9-2/Page 5

BREADING AND BATTERING FOODS

THE THREE STEP BREADING PROCESS


STEP 1
-Flour
STEP 2
-Egg wash
Rack to drain eggwash
STEP 3
-Crumbs
Breaded foods on tray, single layers

Handout #9-3

CALCULATING THE BEST EGG BUY

As a class, calculate the correct answers to the following problems.

1. If extra large eggs cost 95 ¢ per dozen and medium eggs cost 84 ¢ per dozen, which is the best buy?

   Answer: Extra large eggs contain 27 ounces per dozen, so divide 95¢ by 27. The answer is 3½¢ per ounce.

   Medium eggs contain 21 ounces per dozen so divide 84¢ by 21. The answer is 4¢.

   Thus the extra large eggs at 95¢ per dozen is the best buy.

2. If jumbo eggs cost $1.00 per dozen and large eggs cost 92¢, which is the best buy?

   Answer: Jumbo eggs contain 30 ounces per dozen, so divide $1.00 by 30 ounces. The answer is $.028 per ounce.

   Large eggs contain 24 ounces per dozen, so divide 92¢ by 24. The answer is $.03 per ounce.

   The jumbo eggs at $1.00 per dozen are the best buy.

Individually calculate the answers to the questions below.

3. If extra large eggs cost 81¢ per dozen, and small eggs cost 72¢ per dozen, which is the best buy?

4. If large eggs cost 84¢ per dozen, and medium eggs cost 73¢ per dozen, which is the best buy?

ANSWER SHEET FOR HANDOUT #9-3

3. **Answer:** Extra large eggs at 81¢ per dozen.

Calculations: 81¢ divided by 27 ounces is 3¢ per ounce for extra large eggs

72¢ divided by 18 ounces is 4¢ per ounce for small eggs

4. **Answer:** Both cost the same so either would be a good choice.

Calculations: 84¢ divided by 24 ounces is 3½¢ per ounce for large eggs

73¢ divided by 21 ounces is 3½¢ per ounce for medium eggs.

Handout #9-4

CLASSIFICATION OF SOME NATURAL CHEESES

	Hard Cheese	Semi-hard Cheese	Soft Cheese
Bacteria Ripened (12-16 Months)	Parmesan Romano		
Bacteria Ripened (3-12 Months)	American Cheddar Provolone Swiss		
Bacteria Ripened (1-8 Months)		Brick Gouda Jack Muenster	
Bacteria Ripened (1-2 Months)			Limburger
Mold Ripened (2-12 Months)		Blue Roquefort	
Mold Ripened (2-5 Months)			Camembert
Unripened		Mozzarella	Cottage Cream Ricotta

Additional information on cheeses and their classifications is available from the National Dairy Council or from the reference, Quantity Food Purchasing, by Lendal H. Kotschevar

FOOD EVALUATION FORM

Handout #9-5

This is a general food evaluation form that can be used to judge the quality of any food category. Using a possible ten points for each quality trait listed, determine a numerical rating for each food product judged. When a trait does not apply, give it a score of 10 but circle it. An example of this might be the trait of "proper portion" if you are doing your evaluation in the kitchen prior to portioning or serving the product. This is a good form to use with cooks on a daily basis to get them to think critically of the products they make and where they can be improved.

Items Prepared and Evaluated	1	2	3			4	5	6	7	8	9	10	Total Score Possible 100
	General Appearance Appetizing 10	Proper Portion 10	Temperature Proper	Actual	Score 10	Flavor 10	Texture 10	Color 10	Consistency Std. Sizes No Lumps 10	Aroma 10	Size & Shape 10	Edibility Easy to Eat 10	
												316	
	315												

Handout #9-6

INSTRUCTOR'S GUIDE FOR FISH, EGGS, CHEESE AND MILK PREPARATION

1. Allow 20 to 30 minutes for participants to become familiar with the kitchen to be used, the location and operation of equipment, and the location of ingredients needed for the preparation of assigned recipes.

2. Divide participants into pairs and give each couple one of the recipes on Handouts #9-7 through #9-13 to prepare.

3. Ask each pair to first adjust the base recipe yield as noted on the top of the recipe. Ask them to use the Factor Method for adjusting this recipe as was described in Lesson 2 on Standardized Recipes. The adjusted recipe ingredient amounts should be written in the blank column provided on each recipe.

4. After all products have been prepared, evaluate them using the form provided on Handout #9-5. Evaluation can be done by those who prepared each product or by other class participants.

5. Allow adequate time for all products to be prepared, cooled and evaluated.

6. While various products are being completed, participants who finish first can begin to clean up the kitchen facility used and set up tasting forks and small liners to use during the evaluation of the products prepared.

Handout #9-7

TUNA AND POTATO SCALLOP

7 oz. each Main Dish--Fish 9-7

INGREDIENTS	AMOUNT (50 Servings)		PROCEDURE
Potatoes, diced Celery, chopped	5 lbs		Cook potatoes & celery in salted water until not quite tender
Margarine Flour, pastry Milk Onion Juice Pimiento, finely chopped Pepper Salt Worcestershire Sauce Lemon juice	1 lb 10 oz 10 lbs 4 oz 4 oz 2 tsp 1 oz 1½ oz 2 oz		Make white sauce with margarine, flour, milk and seasonings
Tuna, drained, flaked	3 lbs 8 oz		Scale 1½ lbs potato & celery into each of 2 well-greased serving pans (12x20x2 in). Spread tuna flakes over this & arrange another layer of potato & celery on top of tuna.

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Handout #9-7/Page 2

TUNA AND POTATO SCALLOP

INGREDIENTS	AMOUNT (50 Servings)		PROCEDURE
Bread Crumbs	8 oz		Pour 2¼ qts white sauce over each pan and sprinkle 2 cups on top of each pan. Bake at 375°F about 30 minutes or until done.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #9-8a

FISH CAKES

1 cake (#16 scoop) Main Dish—Fish 9-8a

INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
*Canned mackerel, drained or *Canned tuna, drained	1 qt, 3¼ C 1 qt, 3¼ C		Flake fish.
*Onions, chopped Oil or fat, melted	1 cup ½ cup		Cook onions in fat until onions are clear but not brown.
Eggs *Mashed potatoes Catsup Salt	4 large 1½ qts ¼ C 2¼ tsp		Beat eggs. Combine eggs, potatoes, catsup, salt, onion mixture, & fish. Chill. Portion mixture with a No. 16 scoop (¼ cup) and shape into 50 cakes
Dry bread crumbs, toasted	1 $\frac{1}{3}$ cup		Roll a few cakes at a time in crumbs. Place in a single layer on greased sheet pans.

Handout #9-8a

FISH CAKES

2 cakes (#16 scoop each)

	AMOUNT	
INGREDIENTS	25 servings	PROCEDURE
*Canned mackerel, drained	1 quart, 3¼ cups	Flake fish.
or		
*Canned tuna, drained	1 quart, 3¼ cups	
*Onions, chopped Oil or fat, melted	1 cup ½ cup	Cook onions in fat until onions are clear but not brown.
Eggs *Mashed potatoes Catsup Salt	4 large 1½ quarts ¼ cup 2¼ tsp	Beat eggs. Combine eggs, potatoes, catsup, salt, onion mixture, and fish. Chill. Portion mixture with a No. 16 scoop (¼ cup) and shape into 50 cakes.
Dry bread crumbs, toasted	1-1/3 cups	Roll a few cakes at a time in crumbs. Place in a single layer on greased sheet pans.
Oil or fat, melted	½ cup	Sprinkle fat over cakes. Bake at 500°F (extremely hot oven) 20 to 25 minutes until brown.

Serving: 2 cakes provides the equivalent of 2 ounces of cooked lean meat and ¼ cup vegetable.

* BUYING GUIDE FOR SELECTED ITEMS

Food as purchased	50 serving recipe	for serving recipe
Canned mackerel	3-3/4 cans (15 oz. each)...	
or		
Canned tuna	7½ cans (6½ to 7 oz each)..	
Mature onions	6-3/4 oz..................	
Potatoes	3 lbs. 10 oz..............	

Cost per serving:

Total production time:

Adapted from: Quantity Recipes For Child Care Centers. U.S.D.A. Food and Nutrition Service FNS-86, Washington, D.C., 1979.

Handout #9-8b

MACKEREL CAKES

2 cakes (#16 scoop)			Main Dish—Fish 9-8b
INGREDIENTS	**AMOUNT (100 portions)**		**PROCEDURE**
Canned mackerel	13 lb, 2 oz		Drain and flake fish.
*Onions, chopped Oil or fat, melted	1 lb, 8 oz 1 lb		Cook onions in fat until clear, but not brown.
Eggs Mashed potatoes Catsup Salt Dry bread crumbs	1 lb, 12½ oz 1 gal, 2½ qt 9 $\frac{3}{4}$ oz 2 oz 1 lb		Beat eggs. Combine eggs, potatoes, catsup, salt, onion mixture, and fish. Portion fish mixture with #16 scoop (¼ cup). Form into 200 cakes. Roll in crumbs.
Oil or fat, melted	1 lb, 8 oz		Place in a single layer on well-greased sheet pans. Pour fat over cakes. Bake at 500°F (extremely hot oven) 8 to 10 minutes or until browned on the bottom. Turn carefully and bake 3 to 5 minutes longer or until brown on both sides.

2 cakes provide the equivalent of 2 ounces of protein-rich food and ¼ cup vegetable.
*SEE FOLLOWING PAGE FOR VARIATIONS OF MACKEREL CAKES.

Cost Per Serving: ____________________
Total Production Time: ____________________

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INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Oil or fat, melted	½ cup		Sprinkle fat over cakes. Bake at 500°F (extremely hot oven) 20 to 25 minutes until brown.

*BUYING GUIDE FOR SELECTED ITEMS

Food as Purchased	50 serving recipe	for ________ serving recipe
Canned mackerel	$3\frac{3}{4}$ cans (15 oz each)...	
or		
Canned tuna	7½ cans (6½ to 7 oz each)	
Mature onions	$6\frac{3}{4}$ oz....................	
Potatoes	3 lbs, 10 oz..............	9/30/81

Cost per serving: _______________

Total Production Time: _______________

VARIATIONS

A. MAINE SARDINE CAKES: Use 16 cans (12 oz each) Maine sardines in place of mackerel. Portion as in basic recipe.

B. SALMON CAKES: Use 13 cans (16 oz each) salmon in place of mackerel. Portion as in basic recipe.

C. TUNA CAKES: Use 28 cans (6½ or 7 oz each) tuna in place of mackerel. Portion as in basic recipe.

MENU SUGGESTIONS

MACKEREL CAKES	TUNA CAKES
Buttered Broccoli, Carrot and Celery Sticks, Apple, Cornbread, Butter or Margarine, Milk	Buttered Mixed Vegetables, Tomato Wedges, Hamburger Roll, Butter or Margarine, Milk

MARKETING GUIDE FOR SELECTED ITEMS

FOOD AS PURCHASED	FOR 100-PORTION RECIPE	FOR _____ PORTION RECIPE
Mature Onions	1 lb, 11 oz..................	
Potatoes	14 lb, 8 oz..................	

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Quantity Recipes for Type A School Lunches, PA-631, U.S.D.A., Food and Nutrition Service, Washington, D. C., 1971.

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Handout #9-9

SCRAMBLED EGGS AND CHEESE CASSEROLE

5 oz portions			Main Dish--Eggs 9-9
INGREDIENTS	**AMOUNT (48 portions)**		**PROCEDURE**
Butter or margarine	1 lb		Melt butter in 3-gal saucepan.
Flour, enriched Salt Dry mustard Nonfat dry milk	$\frac{3}{4}$ lb 2 Tbsp 4 tsp 1 lb		Combine flour, salt, mustard, and non-fat dry milk. Sift; blend into melted butter. Add liquid; cook and stir until thickened.
Liquid from peas and water to equal	1 gal		
Cheese, processed, grated Peas, cooked, drained	3 lbs		Add cheese; stir until it melts and blends into the sauce. Fold in peas.
Bread cubes, fresh, ½ inch	3 lbs, 2 oz		Arrange ½ of bread cubes over bottom of 2 greased 12-inch by 20-inch by 2½-inch baking pans. Pour ½ of the cheese sauce over bread cubes

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INGREDIENTS	AMOUNT (48 portions)		PROCEDURE
Eggs, well-beaten	36 (3 $\frac{3}{4}$ lbs)		Pour beaten eggs carefully over layer of bread cubes in each pan. Add another layer of bread cubes and cheese sauce to each pan. Bake in oven at 350°F for 40 minutes.

Cost Per Serving: ____________________

Total Production Time: ______________________

Adapted from: Blair, E. D. Casseroles and Vegetables for Foodservice Menu Planning, 1976. Cahners Books, CBI Publishing, Inc., Boston, MA.

Handout #9-10a

CHEESE STRATA

5 oz portion			Main Dish—Cheese 9-10a
INGREDIENTS	AMOUNT (24 portions)		PROCEDURE
Bread Cheese, processed, American, sliced	48 slices 1¼ lbs		Make sandwiches of the bread and cheese, trimming crusts if desired.
			Arrange in a baking pan, fitting the sandwiches in so that entire surface of pan is covered.
Eggs Milk Salt Pepper	16 2¼ qts ¼ cup 2 tsp		Beat eggs; add milk and seasonings; pour over sandwiches. Let stand 1 hour. Bake in oven at 325°F for 40 minutes, or until puffed and browned.
Currant jelly	as needed		Serve with currant jelly.

Cost Per Serving: ____________________

Total Production Time: ____________________

Adapted from: Blair, E. D. Casseroles and Vegetables for Foodservice Menu Planning, Cahners Books, CBI Publishing, Inc., Boston, MA.

Handout #9-10b

BAKED CHEESE SANDWICH

1 sandwich			Main Dish--Cheese 9-10b
INGREDIENTS	AMOUNT (45 portions)		PROCEDURE
Day-old white bread Processed American cheese	90 slices 4 lbs (68 1-oz slices)		Arrange 15 slices of bread in the bottom of each well-greased steam table pan. Put 1½ slices of cheese on each slice of bread; cover with remaining bread.
Milk Eggs Dry mustard Salt Paprika	1½ gallons 36 1 Tbsp 2 Tbsp 1 Tbsp		Combine milk, eggs, mustard, salt and paprika; beat with a wire whip or egg beater until smooth; pour 1/3 of the mixture over sandwiches in each pan; refrigerate 1 hour. Bake at 45 minutes to 1 hour or until puffed and golden brown.

NOTE: DIETARY INFORMATION:

May be used as written for general, low sodium, low fat, bland and low residue diets.

DIABETIC: This recipe provides the following per portion: 2 meat, 2½ bread and 1 fat exchanges.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Handout #9-11

FRIED FISH FILLETS
(Haddock, Scrod, Pike, etc.)

5-6 oz each			Main Dish-Fish 9-11
INGREDIENTS	**AMOUNT (50 portions)**		**PROCEDURE**
Dipping Mixture Milk Eggs Salt	 8 oz 1 lb 1 Tbsp		Add milk to beaten eggs and salt and blend.
Flour Fish fillets (4-5 oz each or larger)	2 lbs (approx) 12 lb, 8 oz-15 lb		Dip fillets which have been cut to size (or left whole, as desired) into flour, then dipping mixture and drain in colander to remove excess dipping mixture. Place colander in pan to recover mixture which drains off, for reuse.
Crumbs	2 lb-2 lb, 4 oz		Remove fish with one hand and place in crumbs; with other hand removed from crumbs, shake to remove excess crumbs and lay flat on trays ready for frying. Use of two hands, one wet with mixture and the other kept dry, will avoid getting crumbs wet and hence unfit for use in crumbing.

INGREDIENTS	AMOUNT (50 portions)		PROCEDURE
Frying fat (for fry kettle)			Place fish in fry basket of a deep-fat fryer and fry at 360°-375°F until a golden brown. This will take about 4 to 5 minutes. It is suggested that in any breading operation, a plan be made and carried out for streamlining the operation. In other words, there should be a logical progression of fish to dipping mixture to crumbs so that there is a minimum of waste motion or crossed lines of work flow.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Treat, N., and Richards, L. Quantity Cookery, 1966. Little, Brown and Company, Boston, MA.

Handout #9-12a

BAKED SCRAMBLED EGGS

1 egg (#16 dipper) Main Dish—Eggs 9-12a

INGREDIENTS	AMOUNT (50 portions)		PROCEDURE
Eggs Salt Milk	50 medium 1½ Tbsps 3 cups		Beat eggs only until well blended; add salt and milk; mix well.
Butter or margarine, melted	½ cup (1 stick)		Pour melted butter or margarine into steam table pan (12x20x2-inch); use a pastry brush to spread butter or margarine on bottom and sides of the pan. Pour beaten eggs into pan; bake about 20 minutes at 350°F, stirring every 5 minutes.

VARIATION: 1. SCRAMBLED EGGS With HAM: Add 1 lb diced, canned ham to egg mixture before baking; stir lightly and bake as directed in Step 3.

NOTES: 1. This recipe yields 1 egg per person. If 2 eggs per person are scheduled, double the recipe and give each person 2 #16 or 1 #18 dipper of scrambled eggs.

DIETARY INFORMATION: May be used as written for general, low sodium, low fat, bland and low residue diets.

DIABETIC: This recipe provides the following per portion: 1 meat and ½ fat exchanges.

Cost per Serving: ____________________

Total Production Time: ________________________ 9/30/81

Adapted from: Cavaiani, M., and Urbechich, M. Simplified Quantity Recipes

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Handout #9-12b

BAKED SCRAMBLED EGGS

1 piece, 2 x 3 $\frac{3}{4}$ inches (meat alternate)		Main Dish--Eggs	9-12b
INGREDIENTS	**AMOUNT (100 servings)**		**PROCEDURE**
Dried egg mix Dry mustard Warm water	6 lb, 4 oz 2 Tbsp 1 gal, 2½ qt		Sift mix and mustard on top of water in mixer bowl. Beat with whip until smooth and aerated.
Butter or margarine	4 oz (½ C)		Melt 1 oz (2 Tbsp) fat in each of 4 baking pans (about 12x20x2-inches). Pour 4 lb, 12 oz (about 2½ qt) egg mixture into each pan. Bake at 350°F (moderate oven) about 15 minutes or until eggs are done. Stir twice after eggs have started to set.

VARIATION

A. BAKED SCRAMBLED EGGS AND CHEESE: Use only 4 lb, 8 oz dried egg mix, 1 gal 2 cups warm water to reconstitute the egg mix, and 1 lb, 12 oz shredded cheese.

Cost per Serving: ____________________

Total Production Time: ________________________

Adapted from: Consumer and Food Economics Institute, Science and Education Administration, United States Department of Agriculture.

Handout #9-13a

OVEN FRIED FISH PORTIONS

1 fish portion — Main Dish--Fish 9-13a

INGREDIENTS	AMOUNT (50 portions)		PROCEDURE
Frozen, raw breaded fish	12 lbs, 8 oz		Put frozen fish portions in a single layer on a well-greased 18x26-inch sheet pan.
Vegetable oil Paprika	1 cup 1 Tbsp		Brush fish portions with oil using a pastry brush, sprinkle with paprika. Bake 20 to 25 minutes or until fish is browned and flakes easily when tested with fork.

VARIATION

A. OVEN FRIED FISH STICKS: Use 12 lb, 8 oz frozen, raw breaded fish sticks instead of fish portions in Step 1. One portion (4 sticks) provides 2 oz of protein.

NOTE: DIETARY INFORMATION:

May be used as written for general, low sodium, low fat, bland and low redidue diet.

DIABETIC: This recipe provides the following per portion: 2 meat and 1 fat exchanges.

Cost per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Handout #9-13b

OVEN FRIED FISH FILLETS

1 fillet			Main Dish--Fish 9-13b
INGREDIENTS	**AMOUNT (50 portions)**		**PROCEDURE**
Fish fillets (perch, cod, haddock, flounder, pollock, rockfish, whiting)	12 lb, 8 oz		Thaw frozen fillets, if necessary.
Salt Milk Dry bread crumbs Garlic powder	1 Tbsp 2 cups 1 qt ½ tsp		Add salt to milk. Combine crumbs and garlic powder; mix well. Dip fillets first in milk and then in crumbs; put in a single layer on well-greased 18x26-inch sheet pans.
Vegetable oil	1 cup		Sprinkle or pour oil over fish being sure to get a little bit of oil on each piece of fish. Bake 20 to 25 minutes at 475°F or until fish is browned and flakes easily when tested with a fork.

NOTE: DIETARY INFORMATION:

May be used as written for general, low sodium, low fat, bland and low residue diets.
DIABETIC: This recipe provides the following per portion: 1 fat, scant ½ bread and 3 meat exchanges.

Cost per Serving: ____________________

Total Production Time: ____________________ 9/30/81

LESSON 10 : MEAT ALTERNATES, TEXTURED VEGETABLE PROTEINS AND CONVENIENCE FOODS

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic techniques involved in using and preparing meat alternates such as dry beans and peas, textured vegetable proteins, and convenience foods.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. describe uses and proper preparation methods for dry beans and peas;
2. define textured vegetable proteins, describe how they are used, and why;
3. discuss and classify convenience foods;
4. discuss the importance of following end-heat instructions on convenience food products;
5. prepare acceptable food products as assigned in this lesson.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.
2. Locate a chalk board for use in the classroom.
3. Arrange for use of a quantity kitchen for participants to use, and arrange for the purchase of ingredients needed to prepare sample recipes in Handouts #10-3 through #10-9. If a kitchen is not available, arrange for

sample products to be prepared or purchased. Samples of the recipes included in this lesson would be preferred over commercially purchased products except for the convenience food products specified.

D. KEY WORDS USED IN THIS LESSON

HYDRATE:	absorption of water by certain substances in food such as salts, starches and proteins.
END-HEAT:	final heating or cooking of a convenience food or other food product to make it ready for service.

E. REFERENCES FOR ADDITIONAL INFORMATION

Blair, C. Casseroles and Vegetables for Foodservice Menu Planning, 1976. Cahners Books International, CBI Publishing Company, Inc., Boston, MA.

Warfel, M. C., and Waskey, Frank H. The Professional Food Buyer: Standards, Principles and Procedures, 1979. McCutchan Publishing Corporation, Berkeley, CA.

LESSON 10 : MEAT ALTERNATES, TEXTURED VEGETABLE PROTEINS AND CONVENIENCE FOODS

LESSON CONTENT	CLASS ACTIVITY
I. MEAT ALTERNATES FREQUENTLY USED IN SCHOOL FEEDING PROGRAMS INCLUDE DRY BEANS, PEAS AND NUTS.	
A. Dry Beans and Peas Should Be Cooked So the Finished Product Will Be Tender and of Good Texture.	
1. Sort out rocks, dirt and other debris; rinse.	
2. Soak by covering with water. Let stand overnight.	
3. To eliminate overnight soak:	
a. For dry beans: boil for 2 minutes and let soak in this hot water 1 hour.	
b. For dry peas: boil for 2 minutes and then let soak in this hot water for 30 minutes.	
4. Cook.	
a. Add 2 tablespoons of salt per gallon of water covering the beans or peas.	
b. Simmer 1 to 1½ hours until product is tender.	
c. Keep pot covered while cooking to preserve heat and save energy.	

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LESSON CONTENT	CLASS ACTIVITY

B. Dry Beans and Peas May Be Used in a Variety of Products, Including:

1. Soups, such as navy bean or split pea;
2. Side dishes such as baked beans;
3. Main dishes such as chili con carne or various casseroles.

C. Nuts Used in School Feeding Programs Are Popular Items.

1. The peanut butter sandwich is always a favorite and is served frequently with cheese to meet the meal requirements.
2. Whole nuts may be served plain as a garnish on a salad or as a dessert or may be mixed with dried fruits and served as a dessert treat.

II. TEXTURED VEGETABLE PROTEINS (TVP) ARE FOOD PRODUCTS USED TO FULFILL PART OF THE MEAT REQUIREMENTS FOR CHILD NUTRITION PROGRAMS.

A. TVP Is Made From Soybeans, Cereal Flours and Other Plant Proteins and Is Available In Various Flavors.

B. To Be Served in a Child Nutrition Program, TVP Must Meet Certain Conditions:

LESSON 10 : MEAT ALTERNATES, TEXTURED VEGETABLE PROTEINS AND CONVENIENCE FOODS

LESSON CONTENT	CLASS ACTIVITY
1. Meet the specifications listed by USDA; 2. Be served in combination with meat, poultry or fish, replacing no more than 30%. 3. Be served in a combination dish such as meat patties, meat loaves, meat sauce, chili, pizza or similar product using ground or chopped meat, fish or poultry. C. TVP Is Easy To Use: 1. Add a specific amount of water to the dry product to hydrate it; 2. Allow it to stand; 3. Blend with other foods in a recipe. D. TVP Is Used As A Means of Reducing Costs Since It Generally Costs Less Than Regular Meat, Poultry or Fish Products. E. Extended Meat Dishes Containing 15% TVP Are Highly Acceptable; Fat From Meat Is Absorbed By TVP, Thus Flavoring It.	

LESSON CONTENT	CLASS ACTIVITY

III. CONVENIENCE FOODS HAVE BEEN AVAILABLE FOR MANY YEARS.

A. Convenience Foods Have All Or Part Of The Labor Otherwise Necessary For Preparation "Built Into" The Product Prior To Purchase.

B. A Convenience Food Is An Item That Requires LESS On-Site Labor To Pre-prepare, Prepare Or Make Ready For Service.

C. Convenience Foods Can Be Classified Into 3 Major Types:

1. Minimally Processed: Have some processing labor built in but require additional on-site labor. Examples would be whole peeled potatoes, or shredded cabbage.

2. Partially Processed: are processed more extensively such as pre-portioned meats or breaded fish products.

3. Completely Processed: require little, if any, further preparation after purchase. Portioning and/or end-heating may be the only required labor for these foods. One example is frozen fully cooked entrées.

LESSON 10 : MEAT ALTERNATES, TEXTURED VEGETABLE PROTEINS AND CONVENIENCE FOODS

LESSON CONTENT

D. Convenience Foods Can Be Classified Based On The Relative Amount Of On-Site Labor Required Before A Food Item Is Ready To Serve.

1. A continuum begins with a "1" for "raw," and ends with "10" for "ready," as is shown below.

Raw Ready
1 2 3 4 5 6 7 8 9 10

2. The higher on the scale a food item appears, the less on-site labor is required to prepare it for service.

3. Judgments as to where specific items appear on the raw-to-ready scale are arbitrary.

4. Handout #10-1 gives samples of where some foods might be classified on this 1 to 10 scale

5. After completing Handout #10-1, it should become evident that almost every foodservice operation today uses some convenience foods.

E. Most Convenience Foods That Would Be Classified As A Number 10 or as Completely Processed Have Specific Directions For Final Preparation.

CLASS ACTIVITY

Distribute Handout #10-1 and discuss the food classified as a number 1, 5, or 10. Then take the 15 food items listed at the bottom of the handout and discuss where each would be classified on the scale from 1 to 10.

LESSON CONTENT	CLASS ACTIVITY
1. Such instructions may include: a. thawing or chilling instructions; b. end-heating instructions; c. portioning and serving suggestions; d. garnishing suggestions. 2. Following given instructions in every detail is usually critical to the success and acceptability of the food item. 3. The margin for error is much smaller when using convenience foods. For example: a. If you roast a fresh 22 lb. turkey and leave it in the over 30 minutes too long, you can probably still use it. It may be overcooked but not ruined. b. If you slice pre-cooked turkey roll into portions, pan it, add broth and end-heat it in the oven, and you leave it in 30 minutes too long, the product will probably be ruined and could not be used as orginally planned.	

LESSON CONTENT

c. Thus the margin for error is much less on the convenience turkey roll where only 5 or perhaps 10 minutes of timing error could be tolerated.

d. This example shows the importance of training cooks in the proper handling of convenience foods in order to maintain top quality food products for customers.

F. Large Districts Such As Detroit Have Found That It Is Economically Wise To Take Some Commodity Food Items, Such As Chickens, And Pay To Have Them Partially Processed, Or Made Into Convenience Foods.

1. In each school kitchen these processed commodities merely require end-heat or finish cooking.
2. This reduces on-site labor involved in tasks that require handwork for cooks.

Materials in this lesson on convenience foods was adapted from the text, The Professional Food Buyer: Standards, Principles and Procedures. See reference list.

CLASS ACTIVITY

Divide participants into pairs and assign each couple one of the recipes to prepare on Handouts #10-3 through #10-8. Use the evaluation form on Handout #10-2 to judge the quality and acceptability of each product prepared.

LESSON 10 : MEAT ALTERNATES, TEXTURED VEGETABLE PROTEINS AND CONVENIENCE FOODS

LESSON CONTENT	CLASS ACTIVITY
	If a preparation kitchen is not available for participants to use, have samples of each recipe made in advance of the class and ask participants to evaluate the sample products using the same evaluation form.

Handout #10-1

RAW-TO-READY SCALE FOR CONVENIENCE FOODS

Raw / Ready

1 2 3 4 5 6 7 8 9 10

Primal meat cuts
Flour, shortening, yeast for baking
Fresh fruits and vegetables for salads
Oils, seasonings
Fresh fish to be cut on-site

Preportioned, uncooked ground meat patties
Frozen bread dough
Canned sauces and soup bases
Instant rice, macaroni and similar products
Gravy bases
Pudding and cake mixes

Baked pies, cookies, and cakes
Sliced bread & Buns
Canned puddings
Sweet rolls and doughnuts
Ice cream and prepared toppings
Bottled salad dressings
Carton milk, sliced cheese
Cups of yogurt

Review the three groupings of sample food above. Then discuss where you would categorize the foods on the list below, using a scale of 1 to 10. You need not confine decisions to 1, 5 or 10, but can use the entire 10-point scale.

Canned pie filling
Pre-cooked turkey roll
Chili seasoning mix
Dry milk powder
Breaded fish squares

Canned corn
Canned soup
Bottle lemon juice
Dry yeast
Frozen green beans

Frozen ice cream squares
Whole fresh apples
Fresh celery
Iced tea mix
Raw pork chop

FOOD EVALUATION FORM

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Handout - #10-2

This is a general food evaluation form that can be used to judge the quality of any food category. Using a possible ten points for each quality trait listed, determine a numerical rating for each food product judged. When a trait does not apply, give it a score of 10 but circle it. An example of this might be the trait of "proper portion" if you are doing your evaluation in the kitchen prior to portioning or serving the product. This is a good form to use with cooks on a daily basis to get them to think critically of the products they make and where they can be improved.

Items Prepared and Evaluated	1	2	3			4	5	6	7	8	9	10	Total Score Possible
	General Appearance Appetizing	Proper Portion	Temperature			Flavor	Texture	Color	Consistency Std. Sizes No Lumps	Aroma	Size & Shape	Edibility Easy to Eat	
	10	10	Proper	Actual	Score 10	10	10	10	10	10	10	10	100
													347
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Handout #10-3

BEANS 'N CHEESE ITALIANO

½ cup			Main Dish—Meat Alternate 10-3
INGREDIENTS	**AMOUNT (50 portions)**		**PROCEDURE**
Dry lima or navy beans Water Bay leaves, medium sized Garlic Salt	4 lbs 2 gals 8 6 small cloves 2 Tbsp		Wash beans; combine with water in large kettle. Tie bay leaves in cheesecloth. Mince garlic with salt. Add bay leaves, garlic and salt to beans.
			Bring to a boil; boil 2 minutes. Remove from heat, let soak 1 hour. Bring to a boil again; boil 45 minutes, or until beans are almost tender. Drain; save cooking water. Remove bay leaves.
Soup, cream of celery Cheese, cheddar, shredded Water from beans Catsup Oregano leaves, crushed	1 50-oz can 1 lb, 2 oz 2 cups 1 cup 1½ to 2 tsp		Blend soup, first amount of cheese, bean water, catsup, and oregano; heat and stir until cheese melts. Add beans; combine lightly.

INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Cheese, cheddar, shredded	6 oz		Turn into greased 12x18x2½-inch steam table pans. Top with remaining cheese. Bake in oven at 350°F for 1 hour, or until hot and bubbly and beans are tender.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Blair, E. C. Casseroles and Vegetables for Foodservice Menu Planning, 1976. Cahners Books, CBI Publishing, Inc., Boston, MA.

Handout #10-4

TOMATO LIMA BEAN CASSEROLE

4 oz Main Dish--Meat Alternate 10-4

INGREDIENTS	AMOUNT (50 portions)		PROCEDURE
Dry lima beans	4 lbs		Wash beans; cover with water; soak overnight. Cook until tender in water in which they were soaked. Drain.
Bacon, sliced Onion, chopped	½ lb 2 cups		Cook bacon until crisp; remove from drippings; cook onion in drippings until soft.
Soup, tomato Bread crumbs, buttered	1 51-oz can ½ cup		Stir in soup and crumbled bacon. Combine with beans. Put mixture in 12x18x2-inch baking pan. Top with buttered crumbs. Bake in oven at 350°F for about 45 minutes.

NOTE: Recipe can be made with 7½ lb fresh or frozen lima beans (5 qts cooked).

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Blair, E. C. Casseroles and Vegetables for Foodservice Menu Planning, 1976. Cahners Books, CBI Publishing, Inc., Boston, MA.

Handout #10-5

ITALIAN RICE AND BEANS

5 oz serving--#6 scoop			Main Dish--Meat Alternate 10-5
INGREDIENTS	AMOUNT (24 portions)		PROCEDURE
Dry navy beans or pea beans Water	3 cups 2¼ qts		Wash beans. Soak overnight in first amount of water. Bring slowly to a boil.
Onion flakes, instant Minced garlic, instant Water	$\frac{2}{3}$ cup 3/4 tsp ¾ cup		Combine onion flakes, instant minced garlic, and remaining water; let stand 10 minutes for vegetables to soften.
Salt pork, finely diced Olive or other cooking oil	½ cup ½ cup		Sauté softened vegetables with salt pork and first amount of oil.
Tomatoes, canned Salt Sugar Sage leaves	3½ cups 2 Tbsp 1 Tbsp 1 Tbsp		Add beans, tomatoes, salt, sugar, and sage leaves. Cover; simmer about 1 hour, or until beans are nearly tender.
Rice, long grain Stock, beef or chicken	1½ qts 3 qts		Wash rice. Add rice and stock to bean mixture. Cover; cook about 30 minutes, or until rice is tender and nearly all stock is absorbed.

INGREDIENTS	AMOUNT (24 portions)		PROCEDURE
Olive or other cooking oil Parsley flakes, instant Cheese, Parmesan, grated	¼ cup 3 Tbsp ½ cup		Add remaining oil, parsley flakes, and cheese. Mix lightly. Serve from counter pans. Garnish with halved cherry tomatoes and parsley, if desired.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Blair, E. C. Casseroles and Vegetables for Foodservice Menu Planning, 1976. Cahners Books, CBI Publishing, Inc., Boston, MA.

Handout #10-6

CRANBERRY BEAN BAKE

5 oz serving—#6 scoop   Main Dish--Meat Alternate   10-6

INGREDIENTS	AMOUNT (32 portions)		PROCEDURE
Beans in tomato sauce	3 54-oz cans		Combine ingredients in a 12x18x2-inch baking pan. Bake, uncovered, in oven at 350°F for 45 minutes, or until hot and bubbly.
Cranberry sauce, whole	1¼ qts		
Prepared mustard, yellow	3 Tbsp		
Ginger, Ground	¼ tsp		
Cloves, Ground	¼ tsp		

Cost Per Serving: ____________________

Total Production Time: ____________________   9/30/81

Adapted from: Blair, E. C. Casseroles and Vegetables for Foodservice Menu Planning, 1976. Cahners Books, CBI Publishing, Inc., Boston, MA.

Handout #10-7

LIMA BEANS PARMESAN

½ cup			Main Dish--Meat Alternate 10-7
INGREDIENTS	AMOUNT (55 portions)		PROCEDURE
Green lima beans, drained Cream of celery soup, condensed Cheese, Parmesan, grated, firmly packed Pimiento, chopped	2 No. 10 cans 2 51-oz cans 1 $\frac{3}{4}$ cups 1 cup		Combine drained lima beans, soup, first amount of cheese, and pimiento.
Cheese, Parmesan, grated	¼ cup		Turn into 2, 18x12x2-inch baking pans. Top with remaining cheese. Bake in oven at 375°F for 30 to 40 minutes.

Cost Per Serving: ________________

Total Production Time: ________________ 9/30/81

Adapted from: Blair, E. C. Casseroles and Vegetables for Foodservice Menu Planning, 1976. Cahners Books, CBI Publishing, Inc., Boston, MA.

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Handout #10-8

MEAT LOAF

4 oz — Main Dish--Ground Beef — 10-8

INGREDIENTS	AMOUNT (5 loaves)	
Ground beef	8 lb	
Ground pork	2 lb	
Bread crumbs, soft	10 oz	
Milk	2 qt	
Eggs, beaten	12	
Salt	¼ cup	
Onion, finely chopped	2 oz	
Pepper	1 tsp	
Cayenne	F. G.	

PROCEDURE

Mix all ingredients (low speed) until blended. DO NOT OVER MIX.

Press mixture into 5 loaf pans 4x9-in.

Meat loaf also may be made in 12x20-x4-inch counter pan. Divide into 4 loaves. Bake 2 hours at 300°F.

VARIATIONS

VEGETABLE MEAT LOAF: Add 2 cups catsup, 8 oz each raw carrots, onions, and celery, and 4 oz green peppers. Grind vegetables. Pour a small amount of tomato juice over loaf before baking.

SOUR CREAM MEAT LOAF: Add 1 qt chopped stuffed olives to meat mixture. Cover the unbaked leaves with cultured sour cream, 1 qt divided among the 5 loaves.

MEATBALLS: Measure with #8 dipper and shape into balls. Proceed as for Swedish Meatballs or Meatballs and Spaghetti.

BARBECUED MEATBALLS: Measure with #8 dipper. Shape into balls. Cover with 1 gallon barbecue sauce.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F. Food for Fifty, 1979. 6th Edition, John Wiley and Sons, New York, New York.

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LESSON 11 : SALAD AND SANDWICHES

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic principles used in the preparation of sandwiches and entree salads.

B. PURPOSE OF THIS LESSON

After completion of this lesson, the participants should be able to:

1. Understand the basic principles of preparing sandwiches and salads for quantity food preparation;
2. Demonstrate the procedures for making hot and cold sandwiches;
3. Evaluate sandwich quality and have some idea of the time required in making them;
4. Understand and demonstrate basic principles of entree salad making and salad bars;
5. Understand and demonstrate the care in preparation, service and storage of salad and sandwiches.

C. INSTRUCTOR PREPARATION FOR THIS LESSON

1. Run duplicate copies of materials you want to use in the lesson.
2. At least 10 weeks before showing, arrange for the film for this lesson:
   a. "Secret Salad Systems," from Ranch dressing or Clorax salesman.

3. Food to be prepared according to the needs of the group, time and budget of preparation is to be done for demonstration or class. It should be ordered or prepared or assignment sheets made.

D. KEY WORDS USED IN THIS LESSON

ENTREE: the principal dish of a meal

SALAD BAR: a "do-it-yourself" assembly line for making one's own salad

SANDWICH: two slices of bread or bun with a filling in between

E. REFERENCES FOR ADDITIONAL INFORMATION

1. School Lunch Journal, published by American School Food Service Association, 411 East Ave., Denver, CO 80222
    a. "Self-Service: It's Elementary," January 1978.
    b. "Belly Up to the Salad Bar," January 1978.
    c. "More Salad Bar," January 1978.
    d. "Combat Inflation with Super Lunches," January 1981.
    e. "Arranging an NSLW Salad Bar," March 1981.
    f. "Salad Bars: Yesterday, Today and Tomorrow," September 1980.
    g. "Spicy Salads that Sell," April 1981.

LESSON 11 : SALAD AND SANDWICHES

2. Food and Nutrition Service Menu Planning Guide for School Food Service Program Aid 1260, USDA. Washington, D. C.: Government Printing Office, Washington, D. C. 10401, May 1980, and revised pages October 1980; revised pages January 1981.

3. The California Iceberg Lettuce Commission, California Iceberg Lettuce Foodservice Handbook, California Iceberg Lettuce Commission, Box 3354, Monterey, CA 93940.

LESSON 11 : SALAD AND SANDWICHES

LESSON CONTENT	CLASS ACTIVITY

I. INTRODUCTION

A. Main Dish Salads and Salad Bars Are Becoming Very Popular in the School Food Service For Various Reasons:

1. customers are nutrition and diet conscious;
2. self-service is popular;
3. opportunity for the customer to be part of the decision-making.

B. Advantages of Self-Serve Operation:

1. increased participation in the school nutrition program;
2. provides an excellent communication tool (student to management);
3. develops creative talents of kitchen personnel.

LESSON 11 : SALAD AND SANDWICHES

LESSON CONTENT

CLASS ACTIVITY

II. SANDWICHES

A. Sandwiches Can Be Served In a Variety Of Ways:

1. assembled, prepared and bagged
2. ingredients served and the customer makes his own; this method of self-service is very popular because it is decision-making by the participant
3. hot, such as toasted, grilled or baked:
    a. grilled cheese
    b. toasted ham and cheese
    c. hamburger
    d. fish sticks

B. Sandwich Production Takes Planning to Be Efficient

1. Have all ingredients ready to use:
    a. soften butter by letting it stand at room temperature; allow 8½ oz of butter for 100 sandwiches (½ tsp each)

LESSON CONTENT	CLASS ACTIVITY
b. wash lettuce thoroughly; core, separate leaves, drain and crisp. Allow five medium heads of lettuce for 100 sandwiches.	
c. slice foods such as tomatoes, cheese and meats evenly. Cross-stack sliced ingredients such as cheese and meat for quick and easy pick-up.	
2. Allow plenty of work space. One slice of bread or a bun takes up at least 4 square inches.	
3. Assemble all equipment and ingredients in advance and place within easy reach toward the back of the table. Arrange ingredients in the order to be used.	
4. Some tips for assembling the sandwich:	Handout 11-1 provides a method for assembling sandwiches.
a. Use both hands (gloved) and grasp the loaf of bread and drop slices in four rows of five each.	
b. With narrow spatula in right hand, spread butter to edges of bread with one sweeping motion. With left hand, scoop a portion of sandwich filling into center of each slice.	

LESSON CONTENT	CLASS ACTIVITY
c. With right hand, use a stroke of the spatula away from you and a stroke toward you to spread filling evenly to edge of bread. With left hand, place lettuce on filling. d. With both hands, grasp loaf of bread and drop off two slices over each filled slice, matching edges of bread. e. Repeat steps 2 through 4 two more times until there are 60 sandwiches in stacks of three. Stacks must be kept low so the cold air of the refrigerator can penetrate the filling. 5. Hold sandwiches together with thumb and first finger of left hand. Cut through several stacks at one time with a sawing motion. 6. Place in sandwich bags or waxed paper or in pans with covers and refrigerate. Do not cover sandwiches directly with a damp towel, as the moisture in the towel may promote bacterial growth. Serve sandwiches the same day they are made.	

LESSON CONTENT	CLASS ACTIVITY
C. Several Precautions For Sandwich Production Must Be Observed:	

C. Several Precautions For Sandwich Production Must Be Observed:

1. Make sandwiches the day they are to be served.

2. Make prepared fillings only in such quantities as will be used during one serving period.

3. Handle bread and fillings as little as possible during preparation:

    a. avoid the use of hands in direct contact with foods if tools can do the job efficiently.

    b. use tongs, scoops, forks and plastic gloves.

4. Avoid stacking sandwiches for refrigeration more than three high. Overstacking will insulate the filling and prevent proper storage temperature.

LESSON 11 : SALAD AND SANDWICHES

LESSON CONTENT	CLASS ACTIVITY
D. Varying the Bread and Rolls Used Will Provide Variety in Flavor, Texture, Size and Shape. They Must Be Made With Whole-Grain or Enriched Meal or Flour. Try: 1. enriched white bread 2. rye bread 3. pumpernickel 4. French bread 5. raisin bread 6. Italian bread	
E. Creative Sandwiches Can Be Made To Provide A Different Taste, Look and Appeal. Handout #11-2 can be used for food preparation planning or for discussion group.	Handout #11-2 can provide some different ideas for sandwich preparation.
III. MAIN DISH OR ENTREE SALAD	
A. Salad Plate Served In Refrigerated Area of the Counter: 1. can be prepared ahead of time	

LESSON CONTENT	CLASS ACTIVITY

2. required records need to be kept, so do not overproduce

3. needed protein components of a salad could be one of the cooked or canned meat, poultry, fish, eggs, cheese, beans

4. need other items on the plate such as vegetable sticks, carrots, celery, zucchini, fruit (canned or fresh), lettuce or other greens

B. Hot Salads Served as a Salad Not A Main Dish Include:

1. hot potato salad;

2. wilted lettuce;

3. German potato salad.

4. crisp garnish such as croutons, celery or carrots, add to the attractiveness of the salad.

IV. BASIC PREPARATION OF SALAD CAN BE FOUND IN THE LESSON ON SALADS AND GELATIN SALADS.

LESSON 11 : SALAD AND SANDWICHES

LESSON CONTENT

CLASS ACTIVITY

V. BASIC PLANNING FOR SALAD BARS

A. The Physical Set-up for Salad Bars May Vary Greatly Because of the Wide Range of Pre-Preparation and the Amount of Money to Invest.

1. Basic needs for a salad bar for a school foodservice:
    - a. table long enough to place a variety of dishes
    - b. serving equipment that will keep food cold:
        - (1) counter pans filled with ice in which to set containers
        - (2) refrigerated plate
    - c. sneeze guards required
    - d. plan for serving protein items to ensure each student receives the required amount
    - e. pre-portion the selection of some items

LESSON CONTENT	CLASS ACTIVITY
f. availability of milk and bread g. cashier at end of line to collect money to determine that plate meets requirements of a reimbursable meal 2. Salad bars may be more elaborate and have specially designed equipment. 3. Locate it to be serviced during the meal hour, and be accessible to students and to kitchen. B. Foods That Can Be Served 1. Provide certain base items daily, such as: a. lettuce b. grated or diced cheese c. tomatoes d. carrots e. cottage cheese f. two kinds of dressing	

LESSON CONTENT	CLASS ACTIVITY
2. Variations that will depend on season of the year and available preparation time in the kitchen: a. cucumbers b. broccoli and cauliflower c. bean sprouts d. sunflower seeds e. celery f. spinach g. radishes h. green pepper slices i. sauerkraut j. zucchini	

LESSON CONTENT	CLASS ACTIVITY

3. Protein requirements can be prepackaged in soufflé cups or sandwich bags and might include:
   - a. cheeses of all kinds
   - b. egg slices, stuffed or grated for a garnish
   - c. chicken, turkey, ham salad
   - d. bean salad
   - e. strips of meat and cheese and meat alone, ham, turkey, or chicken
   - f. chicken wings
4. Protein requirement may be packaged so that customer will be able to select two items:
   - a. peaches and pears, diced or sliced
   - b. pineapple
   - c. orange wedge or apple sauce
   - d. fruit cup

LESSON 11 : SALAD AND SANDWICHES

LESSON CONTENT	CLASS ACTIVITY
e. melon pieces f. grapes, raisins 6. Bread choices could be: a. sliced bread b. crackers c. soft pretzels d. bread sticks e. quick bread f. muffins g. enriched products h. macaroni i. rice salad j. corn sticks 7. Salad dressing choices, usually two at all times and rotate the third choice by the day.	

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LESSON 11 : SALAD AND SANDWICHES

LESSON CONTENT	CLASS ACTIVITY
VI. PHYSICAL ARRANGEMENT OF SALAD BAR A. The Floor Plan of the Salad Bar Depends on the Amount of Space Available. It Can Be Done at the End of a Regular Line, If Necessary. B. Sample Floor Plans of a Limited Number of Schools Are Included in Handout Sheets	Discussion of Handouts #11-3, #11-4 and #11-5 will provide participants a base for thinking about needed space. Class activity could be to plan individually or in groups how to set up a salad bar.
VII. ACCOUNTING SYSTEM A. Need To Know the Cost of The Salad Bar: 1. keep records of raw food costs 2. keep records of labor cost 3. study for a picture of season changes B. Need to Document That Requirements For Reimbursable Meals Are Met C. Requires Forms 1. develop your own forms	

LESSON 11 : SALAD AND SANDWICHES

LESSON CONTENT	CLASS ACTIVITY
2. simplified form used by Okemos School District does not require a lot of time to prepare; it gives a good picture of sales and cost.	Handout #11-6 was developed by and is used in the Lansing School District. Handout #11-7 and #11-8 are preparation ideas developed for use in the Manistee Area Schools

Handout #11-1

QUANTITY SANDWICH PRODUCTION

JOB: Multiple Stack Method
(1 operator)

WHAT TO DO	HOW TO DO IT
1. Place 16 matching slices of bread on board.	1. Use both hands. 2. Place slices of bread in 4 orderly rows of 4 each. 3. Pick up 4 slices of bread with each hand or pick up 8 slices and drop them off as you hold them in both hands.
2. Spread softened butter on all bread slices.	1. Use right hand. 2. Use spatual to spread butter. 3. Spread butter evenly to edges of bread by using one stroke of spatula away from you and another toward you. 4. Another method of spreading butter is to spread it from right to left, completely covering slice of bread in one motion.
3. Place filling on buttered bread.	1. Use right hand. 2. Transfer sandwich filling portions with scoop on vertical center rows of bread in one operation. If filling is sliced cheese, tomatoes or meat, transfer with fork. 3. Use one stroke of a spatula away from you and one stroke toward you to spread filling evenly to edges of bread if it is placed in center of each slice. 4. If filling is placed in upper right-hand corner of bread slice, press filling lightly with tip of spatula and spread it to upper left corner of bread, then complete an "S" motion with blade of spatula spreading the filling as you go. (A left-handed person would reverse this procedure by dipping the filling onto the upper left corner of the bread slice.)
4. Close sandwiches.	1. Use both hands. 2. For each sandwich: Turn bread slices from outside rows over the filling on center rows, matching edges of bread.
5. Place 8 more slices of bread on top of completed sandwiches.	1. Use both hands. 2. Place a bread slice on top of each sandwich in center of board.

WHAT TO DO	HOW TO DO IT
6. Place 16 more slices of bread at side of center sandwiches.	1. Use both hands. 2. Drop off 2 slices of bread at a time on both sides of completed sandwiches.
7. Spread softened butter on 16 top bread slices.	1. Repeat Step 2.
8. Place filling on buttered bread.	1. Repeat Step 3.
9. Place 2 bread slices on top of filling.	1. Use both hands. 2. For each sandwich: Turn 2 bread slices from outside rows over filling on center rows, matching edges of bread.
10. Repeat Steps 2, 3 and 9, except place only a single slice of bread on top of filling to complete third sandwich.	1. Use both hands. 2. Completed sandwiches are stacked three high.
11. Cut sandwiches.	1. Use both hands. 2. Steady each stack of sandwiches, placing thumb and forefinger of left hand over knife point. 3. Draw knife from upper left-hand corner diagonally through center stacks to lower right, cutting through all three sandwiches at one time. 4. Use a sharp knife held in right hand, in a straight downward motion, when cutting each sandwich stack.
12. Transfer sandwiches.	1. Use both hands. 2. Slide board with sandwiches to a wrapper at left of sandwich maker OR wrap each cut sandwich before proceeding to make more sandwiches. 3. Stack sandwiches on trays; allow some space for air circulation around each one.
13. Refrigerate sandwiches.	1. Use both hands. 2. Label tray with variety it contains. 3. Place trays of wrapped sandwiches in refrigerator.
14. Continue entire procedure until desired number of sandwiches have been completed.	1. If a second worker wraps sandwiches, place a second board in front of sandwich maker so they can proceed to make more sandwiches while other persons wraps them.

from: AMERICAN INSTITUTE OF BAKING, Consumer Service Department, 400 East Ontario Street, Chicago, Illinois 60611

Handout #11-.2

CREATIVE THINKING IN SANDWICH PLANNING

Different breads, fillings and additions can increase interest and income:

Could you price a basic sandwich and then charge for "extras"?

Could you offer a choice of soup and sandwich, or even a cup of soup and one-half a sandwich, or small bowl from the salad bar?

CREATIVE SANDWICH COMBINATIONS

SANDWICH	BREADS	SPREADS	VEGETABLES	FRUITS	NATURAL AND PROCESS CHEESE	OTHER
Hamburger	Hard roll Rye bread French or Italian bread	barbecue sauce salad dressing sour cream horseradish	green pepper mushrooms bean sprouts	pineapple avocado	Swiss cheddar mozzarella onion-chive	bacon olives basil oregano
Frankfurter	refrigerated biscuit dough corn batter	sandwich spread barbecue sauce chili sauce horseradish	mashed potatoes coleslaw sauerkraut	pineapple	American cheddar jalapeño pepper bacon	chili bacon
Ham or Luncheon Meat	hard roll English muffin French or Italian bread	salad dressing mustard sandwich spread horseradish	cucumber green pepper cabbage green onions	pineapple apple raisins	pimento muenster provolone cream cheese	pickles olives eggs

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SANDWICH	BREAD	SPREADS	VEGETABLES	FRUITS	NATURAL AND PROCESS CHEESE	OTHER
Cooked Beef or Pork	French or Italian bread Rye bread Hard roll Hamburger bun	Barbacue sauce mustard Pourable salad dressing	cabbage cucumber green pepper mushrooms	apple slices or sauces pineapple	Swiss Monterey Jack brick cream cheese	pickle olives parsley celery
Chicken or Turkey	English muffin Hamburger bun pumpernickel	Mayonnaise sandwich spread barbecue sauce	celery carrot mushrooms cucumber	cranberries pineapple raisins orange	Swiss cheddar provolone Monterey Jack bacon	dill weed pimento nuts eggs
Tuna, Salmon or Shrimp	Frankfurter bun English muffin	salad dressing Tartar sauce chili sauce sandwich spread	cucumber mushrooms cabbage	pineapple raisins apple	cheddar cream cheese Swiss Muenster	curry bacon nuts pimento
Cheese	Raisin bread Rye bread English muffin	mustard chili sauce jelly or preserves	carrot cucumber green pepper	pineapple apple raisins		nuts olives bacon

SANDWICH	BREADS	SPREADS	VEGETABLES	FRUITS	NATURAL AND PROCESS CHEESE	OTHER
Egg	English muffin Raisin bread Rye bread	mayonnaise mustard catsup chili sauce tartar sauce	spinach green pepper mushrooms zucchini	avocado	pimento cream cheese Swiss jalapeño pepper	nuts olives bacon parsley
Peanut Butter	Raisin bread bagel fruit and nut bread English muffin	marshmallow creme jelly or preserves honey salad dressing	celery carrot lettuce	banana apple raisins dates	cream cheese American	cinnamon bacon nuts olives

DO:

--Make sandwiches the day they are to be served.

--Have all ingredients ready and use production line method for putting together will save time and energy.

--Use softened butter or salad dressing as a base instead of melted shortening for cold sandwiches.

DO:

--Handle bread and filling as little as possible.

--Stack sandwiches to be refrigerated only 3 layers high; overstacking acts as an insulator to the filling and prevents proper storage temperature.

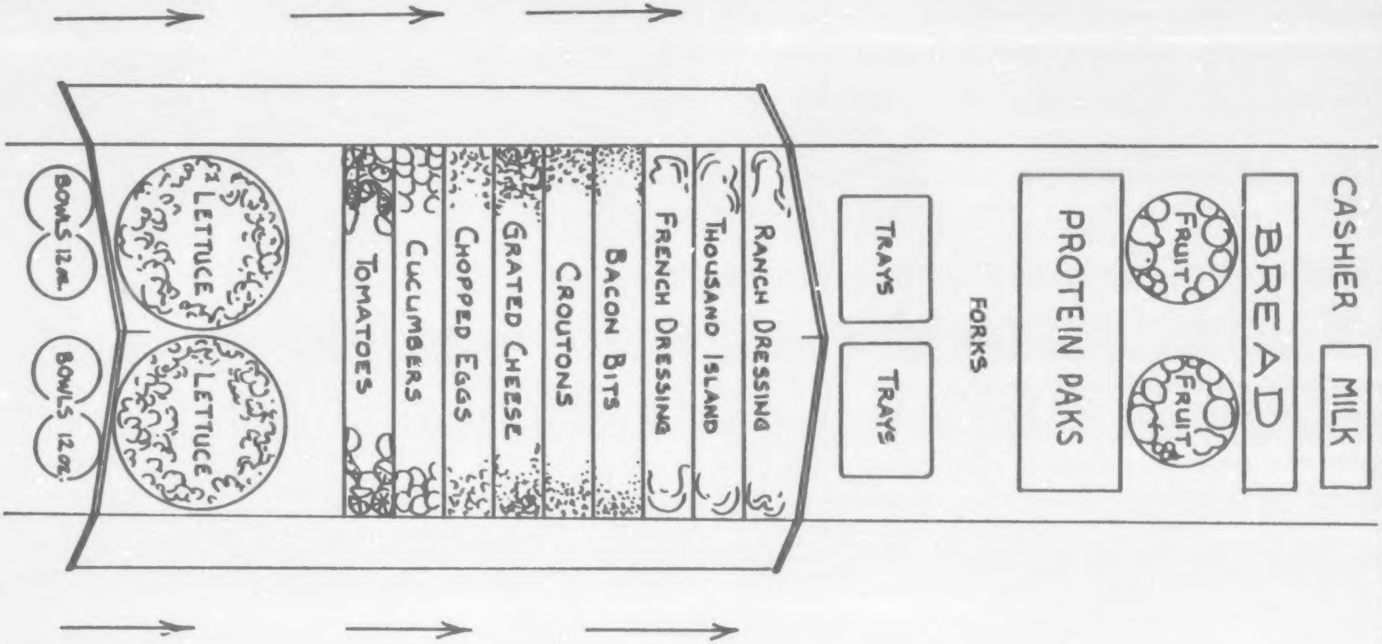
--Try different sandwich wraps until the best one to meet kitchen and storage needs has been found.

--Keep quick breads in freezer for the unexpected request for "extra." Thaw, butter, cut and serve for refreshments on salad plate.

HANDOUT # 11-3

ELEMENTARY SCHOOL SALAD BAR

STUDENTS MUST TAKE SALAD, PROTEIN PAK, FRUIT, BREAD AND MILK


BOWLS 12 oz.
LETTUCE
BOWLS 12 oz.
LETTUCE
TOMATOES
CUCUMBERS
CHOPPED EGGS
GRATED CHEESE
CROUTONS
BACON BITS
FRENCH DRESSING
THOUSAND ISLAND
RANCH DRESSING
TRAYS
TRAYS
FORKS
PROTEIN PAKS
FRUIT
FRUIT
BREAD
CASHIER
MILK

Prepared at Fremont Public Schools, Manistee School District

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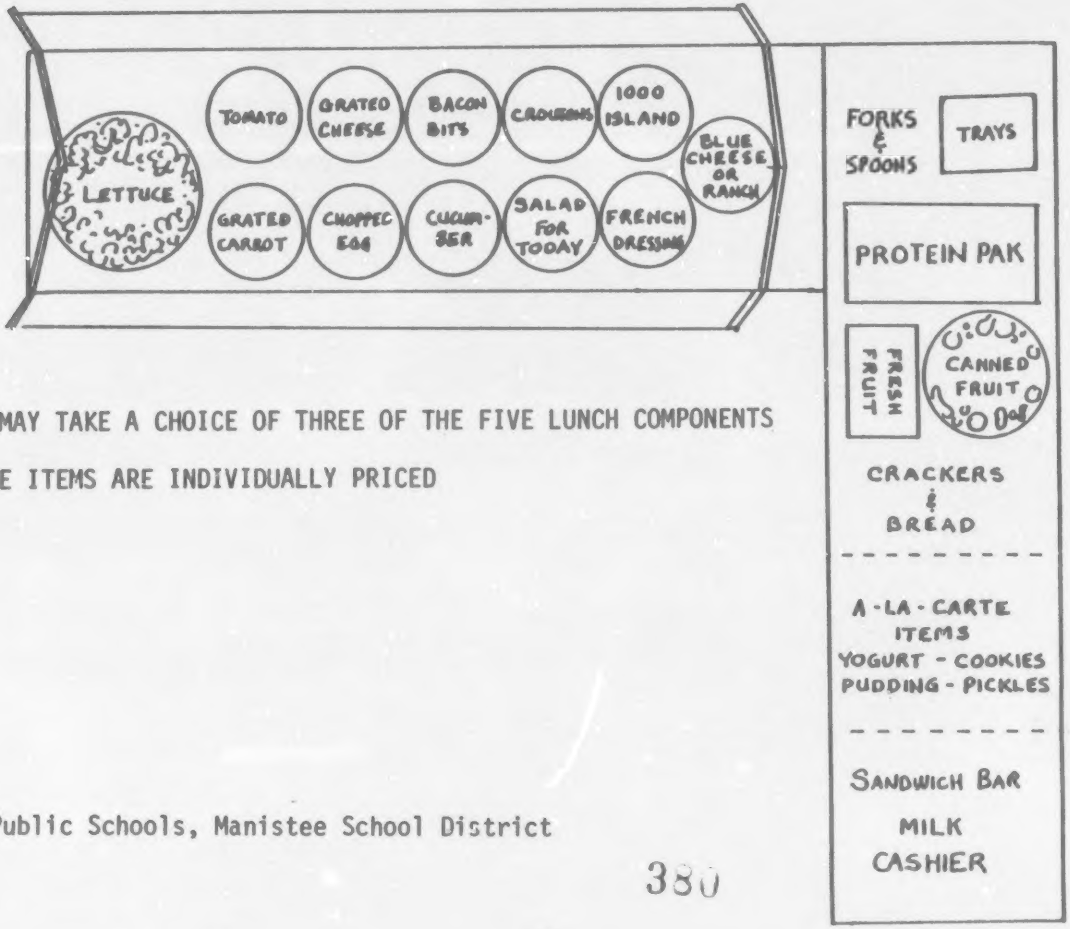
HANDOUT #11-3

HIGH SCHOOL AND JUNIOR HIGH SALAD BAR


LETTUCE
TOMATO
GRATED CHEESE
BACON BITS
CROUTONS
1000 ISLAND
BLUE CHEESE OR RANCH
GRATED CARROT
CHOPPED EGG
CUCUMBER
SALAD FOR TODAY
FRENCH DRESSING
FORKS & SPOONS
TRAYS
PROTEIN PAK
FRESH FRUIT
CANNED FRUIT
CRACKERS & BREAD
A-LA-CARTE ITEMS
YOGURT - COOKIES
PUDDING - PICKLES
SANDWICH BAR
MILK
CASHIER

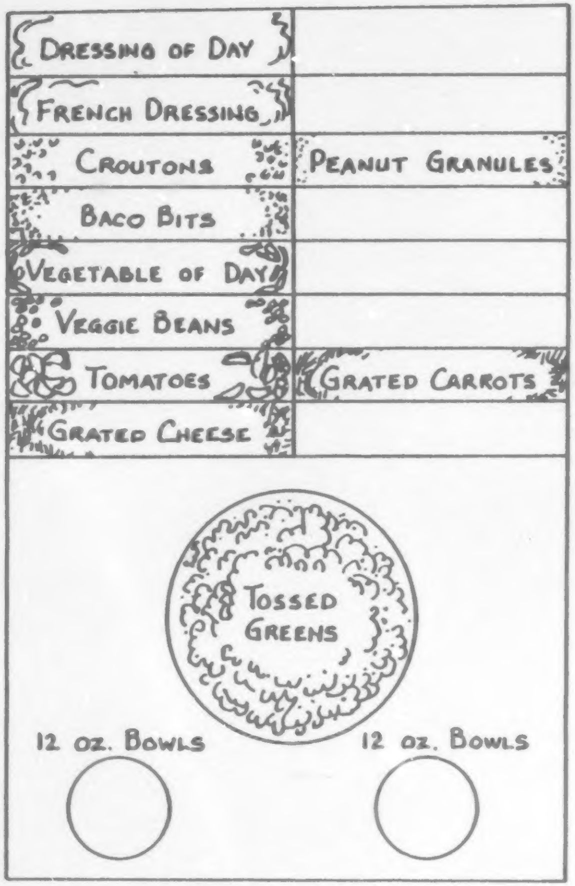
STUDENTS MAY TAKE A CHOICE OF THREE OF THE FIVE LUNCH COMPONENTS

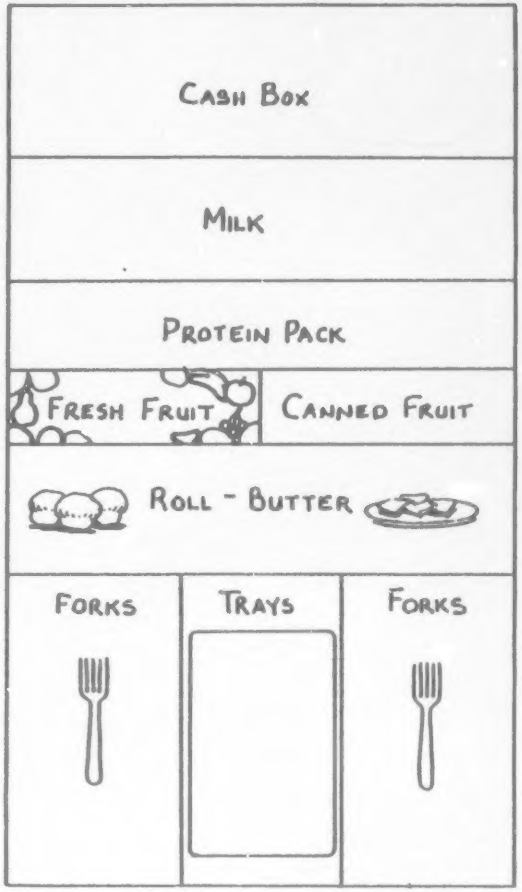
A-LA-CARTE ITEMS ARE INDIVIDUALLY PRICED

Fremont Public Schools, Manistee School District

HANDOUT #11-3

LANSING SCHOOL DISTRICT


DRESSING OF DAY
FRENCH DRESSING
CROUTONS
PEANUT GRANULES
BACO BITS
VEGETABLE OF DAY
VEGGIE BEANS
TOMATOES
GRATED CARROTS
GRATED CHEESE
TOSSED GREENS
12 OZ. BOWLS
12 OZ. BOWLS


CASH BOX
MILK
PROTEIN PACK
FRESH FRUIT
CANNED FRUIT
ROLL - BUTTER
FORKS
TRAYS
FORKS

Lansing Public Schools Food Service Dept.

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HANDOUT #11-3

DRAW YOUR OWN SALAD BAR DESIGN

Handout #11-4

LANSING SCHOOL LUNCH SALAD BAR FEASIBILITY SURVEY

STUDENT SURVEY

Want a Salad Bar?

How does this sound?

- Tossed Greens
- Grated Cheese
- Tomatoes
- Grated Carrots
- Veggie Beans
- Bacon Bits
- Croutons
- Peanut Granules
- Vegetable of the Day (One per day--onions, bean sprouts, green pepper, sliced cucumber)
- Dressing--(French or House Dressing)

All this is to be accompanied by a Protein Pack which would include either--Roll or Garlic Toast or Whole Wheat Bread; cold cuts and cheese; ½ cup canned fruit or fresh fruit and ½ pint milk.

The total cost would be 80 ¢ per day; if you have a free or reduced lunch, you could go through this line. Least expensive way would be to buy a weekly lunch ticket.

What we need to know:

☐ 1. I like the idea -- would buy occasionally (at least once a week).

☐ 2. Would never go through the salad line.

☐ 3. My favorite--would go through the salad line at least 3 times a week.

Handout #11-5

STUDENT AND ADULT SALAD BAR LUNCH

Salad bars are designed for customers to serve themselves. The lunch consists of salad, fruit, bread product, butter and milk.

SALAD BASE

Lettuce, alone
Lettuce w/ chopped spinach
Lettuce w/shredded red cabbage
Lettuce w/ any other combination of salad greens

TOPPINGS FOR BASE

Offer at least four of the following daily. Important to have a variety of colors, shapes, textures, and flavors combinations. Vary offerings continually to avoid boredom.

Alfalfa or Bean Sprouts
Beets, julienne or pickled
Carrots, grated or sliced
Celery, chunked or chopped
Broccoli Flowerettes
Cauliflowerettes
Chick Peas or Frozen Peas
Green Peppers, chopped or rings
Mushrooms, fresh, sliced
Onions, chopped or rings
Rutabaga, chopped or rings

FRUIT COMPONENT

Offer one daily

Offer any fruit you would offer on your entree line. Don't forget fresh fruit when the price is right.

BREAD COMPONENT

Offer one daily.

Choice of different breads
Cinnamon bread or rolls
Dinner rolls
Garlic or Cinnamon toast from bread
Garlic or Cinnamon toast from hot-dog or hamburger buns
Raisin Bread
Muffins, fruit or grain
Quick breads, fruit or grain
Biscuits, Corn Bread, Bagels
Boston Brown Bread
Bread sticks, Crackers, Pretzels (sof
Garlic Bread
Cornbread

TOPPINGS FOR BASE (continued)

Sweet Potato, julienne or grated
Tomatoes, Cherry, sliced or chopped
Tomatoes (out of season) Canned, drained, chilled and chopped
Zucchini, sliced, chopped or pickled

PROTEIN COMPONENT (in packs)

Offer at least three daily julienne, chopped or flaked

Bologna, cheese, eggs, ham, chicken, roast beef, salami, taco meat, turkey, (ham, roll or breast), tuna

OTHER PROTEIN ITEMS

Cottage cheese, feta cheese, tofu
Marinated "veggie" Beans

GARNISHES

Offer 1 or 2 daily and vary them

Croutons, Bacon bits, Peanut Granules, Sunflower Seeds, Wheat Nuts, Taco Chips, Pickle Slices, broken chips, Gold Fish crackers, Peanuts

DRESSINGS (Offer 3 Choices)

French--Thousand Island--Ranch
Blue Cheese--Oil & Vinegar
Italian--Green Goddess

ADDITIONAL ITEMS

Potato salad, Sauerkraut Salad, Three Bean Salad, Corn Relish, Pickles, Macaroni Salad, Carrot Salad, Coleslaw, Pickled Vegetables

The secret of making a salad bar successful is to control your portion sizes. For the salad, control it with the size of the bowl, using either a 9 or 12 oz bowl, the other items by plate size or serving utensil size. Most importantly, control the protein--the most expensive item--by putting 2 oz portions in a "protein pack." This is nothing more than a baggie. If the students do not like the items mixed together, use the smallest soufflé cups for egg, cheese, tuna and chopped meat, allowing the students to take three.

Change toppings, garnishes, breads, and fruit offerings frequently to avoid boredom. Also, occasionally feature a specialty salad, such as Taco Salad or Greek Salad to accomplish the same.

Prepared by: Kathryn Petersen--Manistee Area Public Schools

Handout #11-6

OKEMOS PUBLIC SCHOOLS

CAFETERIA MENU COST ANALYSIS

Food $ 46.14
Milk $ 20.85
Paper $ 11.15
Total $ 78.14

(✓) High School ( ) __________
( ) __________ ( ) __________

Date 5/18/81
Number Served 162

Ingredient	Amount On Hand	Amount Sent	Amount Used	Amount Unused	Amount P/Unit	Amount P/Total	Remarks
Lettuce		40	.10	30#		14.40	
Bacon bits		6 1/4	3 1/2	2 3/4		3.19	
Croutons		2 1/2#	1#	1 1/2#		1.22	
Carrots		3#	3/4#	2 1/4#		.36	
Eggs chopped							
Grated cheese		16	5	11		.44	
Tomatoes							
Cucumber		8	1	7		1.83	
Sunflower Seeds							
Peanuts & Raisins		5 1/2#	1 1/2#	4#		2.20	
Bean sprouts							

MSU-NET
FSHN/81

Handout #11-6/Page 2

Ingredient	Amount On Hand	Amount Sent	Amount Used	Amount Unused	Amount P/Unit	Amount P/Total	Remarks
Broccoli							
Cauliflower							
Ranch Dressing		8				2.64	
1000 Island		10½	11	7½		1.80	
Oil & Vinegar							
French Dressing		14	7¼	6¾		1.49	
Protein Pack: Turkey, Brat							
Cheese	servings	204	56	148		5.92	
Ham							
TOTAL							

Handout #11-6

SENIOR HIGH SCHOOL

May 4-8, 1981
5 School Days

SALAD BAR

Number of Students	689	585.65
Adults	78	93.60
Reimbursements	16 x 689	110.24
Free	13 x .835	10.86
Reduced	1 x .635	.64
		800.99
		--588.12
		212.87 OK

	Food	223.52
	Milk	101.69
	Paper	52.56
1207 x 5	Labor	210.35
		588.12

			Adults		Students	
Food	Milk	Paper	No.	Receipts	No.	Receipts
46.14	20.85	11.15	21	25.20	126	107.10
47.95	21.23	10.72	13	15.60	148	125.80
36.97	18.80	9.73	10	12.00	133	113.05
41.80	21.50	11.09	16	19.20	143	121.55
50.66	19.31	9.87	18	21.60	139	118.15
223.52	101.69	52.56	78	93.60	689	585.65

Handout #11- 6

SALAD BAR

OKEMOS PUBLIC SCHOOLS

CAFETERIA MENU COST ANALYSIS

Food $________
Milk $________
Paper $________

(✓) High School
( ) ________
( ) ________
( ) ________

Date 5/8/81
Number Served 162

Sack Milk

Ingredient	Amount On Hand	Amount Sent	Amount Used	Amount Unused	Amount P/Unit	Amount P/Total	Remarks
Fruit: C. Pineapple		2/No. 10	2 3/4	1 2/3 can		.42	
Can Peaches		2/No. 10	0	2/No. 10		.52	
Lemonade	18+	34	19	33		2.31	
Rolls: 80							
70						1.62	
70							
Misc: Slaw		10#	2 3/4#	7 1/4 #		1.74	
Macaroni Salad		10 1/2	3	7 1/2 #		1.20	
Bean Salad		10 1/2#	3#	7 1/2 #		2.13	
						45.40	

Ingredient	Amount On Hand	Amount Sent	Amount Used	Amount Unused	Amount P/Unit	Amount P/Total	Remarks
PAPER:							
12 oz Bowls		200	38	162		9.72	
A/C Trays		10	3	7		.14	
Forks							
Napkins		3	2/3	2 1/3 pk		1.29	
Ch. Trays							
						11.15	
White Milk							
Choc. Milk							
TOTAL				162		20.85	

Handout #11-7

ETHNIC SALAD IDEAS

ITALIAN:	Add romaine to your lettuce and basil, oregano, and vinegar to the tomatoes. Offer parmesan cheese and creamy Italian dressing. Romaine, lettuce, sliced mushrooms, and lima beans with parmesan cheese. Pizza Salad: Add pizza seasoning to a red dressing, pepperoni to the protein pack, and mozzarella cheese to garnish.
CHINESE:	Lettuce, bean sprouts, water chestnuts, bamboo shoots, slant-cut celery, topped with chow mein noodles. Mayonnaise and soy sauce as the house dressing.
GREEK:	Salata: Romaine, lettuce, spinach, feta cheese, sliced black olives, and chick peas. Oil and vinegar dressing.
MEXICAN:	Taco Salad: Lettuce, hamburger with taco seasoning, chopped tomatoes, and yellow cheese. Serve with a tomato-based French dressing with a little mild chili sauce added. Serve hot sauce on the side if the students like it. Top with taco chips. Lettuce, tortilla chips, grated cheese, avocados, pinto or refried beans. Have them build their salad on a big flour tortilla. If proportioned properly, the beans and cheese can meet requirements. If this gets too hard to do, serve small amounts of chopped ham or turkey. Call this an "Ensalada de Fríjoles"--salad with beans.
WAIKIKI:	Lettuce, pineapple, chicken and other fruits. Top with toasted coconut.
PANAMEÑO: (PANAMANIAN)	Lettuce, oranges, grapefruit sections, avocado, onion and ham or turkey. Top with fruit dressing.

ASSYRIAN: This is also a famous Lebanese salad. Lettuce, bulgur, and any number of cheese and vegetable additions. Bulgur is cracked whole wheat that is soaked in water for about half an hour, drained and chilled. It looks best if it is mixed with the lettuce, but this might not be acceptable to the customers. The Lebanese salad is called Tabouli.

Other Ethnic Additions:
Hot potato salad and wilted lettuce--Germany
Pickled red cabbage--Scandinavian
Pickled vegetables--Italy

FAMOUS RESTAURANT SALADS

WALDORF: Apples, celery and walnuts. There are numerous variations of this favorite. Find the one best suited to the customers.

BRENNON'S: Jackson Salad Egg wedges, bacon and chives on a bed of greens with a creamy dressing.

ARTURO'S: Marinated zucchini, olives, pepperoni and tomatoes on lettuce.

LET THE IMAGINATION RUN WILD WITH SALADS!
KEEP STUDENTS GUESSING ABOUT WHAT'S NEXT!

Prepared by: Kathryn Petersen
Manistee Area Public Schools

Handout #11-8

MERCHANDISING THE SALAD BAR

If not carefully planned, salad bars have a tendency to become monotonous. They must be "sold" just as the daily offerings must be well-merchandised if maximum participation is to be achieved. Some methods that could be considered for merchandising the salad bar are:

1. Vary the regular toppings and protein packs when it is felt the students are getting bored.
2. Add relishes and pickles when they are affordable. These need not be expensive. Corn relish is easy to make from canned corn and almost anything can be pickled, and will be well-received.
   Hint: Drain veggie beans and marinate them for an inexpensive chick pea variation.
3. Offer a macaroni salad, potato or molded salad occasionally. Sauerkraut salad is a nice addition, even though it does not move quickly; it is easily kept on hand, however.
4. Develop a special ethnic salad to complement an ethnic entree. See the suggestions attached for possible combinations.
5. Feature a "Famous Restaurant" salad. Waldorf is an easy "build your own" with apples, celery and nuts as toppings for the lettuce. Serve chicken wings as the protein item. The kids love them cold. With the excess cut off, 3 little "drumsticks" can be served and the protein requirements met.
6. Offer a "house" dressing which complements the featured salad.
7. Advertise the salad bar--particularly the specialty salads on the menu board or in the school bulletin.

8. At the salad bar, put up a sign which tells the students how to build the special salad. Be sure to offer other toppings for those who do not wish to try the new salad.

9. Change the bread offering frequently. See the set-up sheet for ideas.

10. Put signs on the sneeze guard which tells the students what the new items are. Also, label the house dressing.

11. When fresh fruits and vegetables are high, use molded salads with canned fruits and vegetables.

12. Counter or table should be attractive; methods need to be learned to keep cold foods cold; shallow pans need to be replaced more often than deep pans, although the shallow ones have more appeal.

13. Use YAC group and the advisory committee to promote the "salad bar" as well as helping in the evaluation.

14. If unsure about starting a salad bar, try serving it at first just one day a week, then pick the low participation day.

Prepared by: Kathryn Petersen
Manistee Area Public Schools

LESSON 12 : PROGRESS TEST

A. GOAL OF THIS LESSON

The goal of this lesson is to review the most important aspects of the past three lessons, by administering the following Progress Test.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. summarize and review the important information presented in Lessons 9, 10 and 11.
2. emphasize the most important points presented in Lessons 9, 10 and 11.
3. identify subject areas in which participants desire or need further study and practice.

NOTE: The Progress Test should NOT scare or humiliate participants or be used as a device to keep them from continuing on with further lessons. There is no minimum score of success. This is an exercise or learning activity just as the other lessons have been.

C. INSTRUCTOR PREPARATION FOR CLASS PROGRESS TEST

1. The time allowed for this lesson is approximately 25 minutes.
2. Duplicate sufficient copies of Progress Test.
3. How the Progress Test should be given:
    A. Pass out copies of the Progress Test to each participant.
    B. Provide pens or pencils to those who may not have brought their own.
    C. Explain that the reason for this Progress Test is to review the important information presented in the past three lessons.

LESSON 12 : PROGRESS TEST

D. Briefly go through the test together to explain the different kinds of questions to be sure that all participants know what they need to do for each question.

E. Allow approximately 25 minutes for participants to complete the test.

F. Allow participants to keep their own tests while answers are discussed.

G. State aloud which answer(s) is(are) correct for each question.

H. Discuss how to change false statements so they read "true".

I. Lead a class discussion relating to reasons why other choices, if given, are incorrect. Ask participants to give examples of the application of each question to their school foodservice situation.

J. Allow any participants who so desire to retake the test on their own time.

K. Provide additional references on any topic to participants who desire further information.

PROGRESS TEST

True or False

In the space to the left of the number, place a "T" if the statement is true, and an "F" if the statement is false.

____1. Natural cheese is made directly from milk or whey.

____2. Eggs may be used as part of the protein requirement.

____3. All fish sticks are cod fish.

____4. French toast and pancakes can only be used in the breakfast program.

____5. Paprika and parsley are garnishes that improve the appearance of fish dishes.

____6. Cooking eggs at too high a temperature or for too long will cause the egg protein to become tough and shrink.

____7. Cheese soufflé is an item that can be easily shipped to other schools within the district.

____8. Cottage cheese can be used in the form of salad or an ingredient for pizza and pancakes.

____9. A cheese alternate can be 50% of a dish with other 50% natural cheese.

___10. Mackerel, tuna and salmon can be used interchangeably in a recipe.

___11. Dried milk may be reconstituted and used as a beverage if mixed with whole milk.

___12. Salad bars are only to be used for *à la carte* meals.

___13. Salad bars are too expensive to operate for school lunches.

___14. Sneeze guards are required in areas where customers help themselves to food.

PROGRESS TEST, Page 2

___15. Prepackaging protein items for a salad bar insures each student meets daily requirements for reimbursements.

___16. Sandwiches prepared two days ahead of time and stored in the refrigerator retain their freshness and acceptability.

___17. Sandwiches made from bread baked on the premises are more nutritious than "store-bought" bread.

___18. A taco salad is the same as a taco sandwich, except that it is served cold and may have a little more lettuce.

___19. Enriched macaroni products may count as a bread requirement in school lunch programs.

___20. Cryovac is a process of packing meat in a moisture-vapor-proof wrap removing all air. It also ages the meat.

___21. Meat tenderness is affected by the quantity and kind of connective tissue present in the meat.

___22. Cooking time for frozen meat is two to three times that of refrigerated meat.

___23. Roasting is the term applied to cooking meat in the oven.

___24. Meat or meat products should "rest" before slicing on a mechanical slicer to produce the best-looking slices.

___25. Moist heat is used to cook less tender cuts of meat.

___26. Protein-fortified macaroni products have had non-fat dry milk or protein concentrates added and can be counted as part of the protein requirement.

___27. Only elbow macaroni is acceptable in the school lunch program.

___28. Whole turkeys should be cut up for roasting; breasts in one pan, legs and thighs in another, leaving backs and wings for turkey stock.

___29. Fresh ground beef is a perishable item and should not be stored in the refrigerator for more than two or three days.

___30. Ground beef that has little or no fat content tends to be dry and tasteless.

ANWER SHEET

PROGRESS TEST 12

1. *True*
2. *True*
3. *False*
4. *False*
5. *True*
6. *True*
7. *False*
8. *True*
9. *True*
10. *True*
11. *False*
12. *False*
13. *False*
14. *True*
15. *True*
16. *False*
17. *False*
18. *True*
19. *True*
20. *True*
21. *True*
22. *True*
23. *True*
24. *True*
25. *True*
26. *True*
27. *False*
28. *True*
29. *True*
30. *True*

LESSON 13 : SAUCES, GRAVIES AND SOUPS

A. GOAL OF THIS LESSON

The goal of this lesson is to understand and master the basic techniques involved in using and preparing various sauces, gravies and soups.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. describe and identify the quality standards for sauces, gravies and soups;
2. identify the ingredients used in sauces and gravies;
3. describe how to prepare a roux and a whitewash;
4. describe and define the four basic types of sauces;
5. describe the role soups play in a meal, and the types of soups that fill these roles; and
6. prepare a quality sauce, gravy or soup as assigned.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout material.
2. Locate a chalk board for use in the classroom.
3. Arrange for use of a quantity kitchen for participants to use, and for the purchase of ingredients needed to prepare sample recipes in Handouts #13-2 through 13-7. If a kitchen is not available, arrange for sample products to be prepared or purchased. Samples of the recipes included in this lesson would be preferred over commercially purchased products, except for the convenience food products specified.

LESSON 13 : SAUCES, GRAVIES AND SOUPS

D. KEY WORDS USED IN THIS LESSON

SLURRY:	a liquid containing dissolved flour or other starch, either thin and uncooked, or thicker and cooked, as a gravy would be. This mixture is called a whitewash.
EMULSIFIED FAT:	very small globules of fat held in a liquid in suspension to prevent separation of the fat from other ingredients
ROUX:	a mixture of equal amounts of melted fat and flour
CLARIFY:	remove sediment from soup stock (or coffee) by dropping raw eggs into it

E. REFERENCES FOR ADDITIONAL INFORMATION

Jordan, H., Levitz, L., Utgoff, K., Lee, H. "Role food characteristics in behavioral changes and weight loss," Journal of American Dietetic Association, July 1981, pp. 24-29.

Kotschevar, Lendal H. Standards, Principles and Techniques in Quantity Food Production. Cahners Books, CBI Publishing Company, Inc., Boston, MA, 1974.

Mizer, David A., and Porter, Mary. Food Preparation for the Professional. Canfield Press, San Francisco, CA, 1978.

Peckham, Gladys C., and Freeland-Graves, Jeanne H. Foundations of Food Preparation. Macmillan Publishing Co., Inc., New York, New York, 1979.

West, Bessie Brooks, Shugart, G. S., and Wilson, M. F. Food for Fifty. John Wiley and Sons, New York, New York, 1979.

LESSON 13 : SAUCES, GRAVIES AND SOUPS

LESSON CONTENT

CLASS ACTIVITY

I. SAUCES OR GRAVIES ARE USUALLY RICHLY FLAVORED STOCKS OR LIQUIDS THAT GIVE MOISTNESS, RICHNESS OR FLAVOR TO FOODS, AND MAY IMPROVE THE APPEARANCE OF FOODS.

A. The Standards For a Good Sauce or Gravy Include:

1. a soft sheen imparted by tiny pinpoint globules of emulsified fat;
2. texture that is smooth and velvety with no lumps;
3. no evidence of uncooked starch in taste or texture;
4. no evidence of being pasty, murky or cloudy.

B. The Ingredients Used in Sauces and Gravies Include:

1. stocks which are thin liquids flavored by the soluble substances of meats and may be brown or white by classification:

LESSON CONTENT	CLASS ACTIVITY
a. brown stocks are made from well-browned meat, bones and vegetables. b. white stocks are made from unbrowned meat, bones and vegetables. 2. thickening agents, usually flour or cornstarch, but other starches can be used, such as arrowroot. a. A mixture called a roux, half fat and half flour by weight, is most often used: (1) The fat is melted, flour added and the mixture is cooked about 10 minutes until it is quite frothy and leaves the pan bottom easily. (2) A roux when properly cooked, has a light hazelnut odor and a slightly gritty texture.	

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LESSON CONTENT	CLASS ACTIVITY

(3) Brown, blond or white roux are made from well-browned, lightly browned, or unbrowned flour, respectively.

b. Some starches or flour are blended with a liquid to make a slurry for thickening called "whitewash." It gives a less smooth flavor and is more apt to lump.

c. Starches differ in their thickening power, viscosity and clarity, so substitution of one for another may not be wise. Using recipes and following them closely is best guarantee of high quality in sauces and gravies.

C. The Four Basic Types of Sauces Are Known as Mother, or Leading, Sauces:

1. brown sauce which is brown stock thickened with brown roux

2. veloute sauce which is white stock thickened with white roux

LESSON CONTENT	CLASS ACTIVITY

3. bechamel sauce which is chicken stock thickened with white roux

4. tomato sauce which is thickened tomato purée which may contain brown stock

D. From These Basic Sauces Many Variations Are Possible, Although Relatively Few Are Used In Child Nutrition Programs.

1. Simple sauces are most popular with children.

2. Tomato-flavored sauces such as barbecue sauce are popular with all-aged students.

E. Gravies Are Sauces Made From Meat Drippings Thinned with Stock or Other Liquid and Then Thickened, Usually With Flour.

1. Some cooks have eliminated pan drippings in gravy, and use high quality mixes instead. Other cooks claim that using drippings is the only true way to make good gravy.

2. A pan gravy or an au jus gravy is an unthickened gravy made of seasoned meat drippings, sometimes clarified and having a meat base added for a flavor booster.

II. SOUPS SHOULD BE APPEALING AND RICH IN FLAVOR AND SHOULD STIMULATE THE APPETITE.

A. Soups Vary Considerably in Nutritive Value.

1. Some are hearty and will help meet some of the basic meal requirements for the Child Nutrition Programs.

2. Others are light but rich in flavor and can be served as appetizers or to complement other foods.

3. People eat slower and consume fewer calories if they have soup.

B. There Are Two Types Of Soups:

1. appetizer soups are those that precede a regular meal; they:

    a. should be stimulating and light;
    b. include clear soups such as bouillons, consommés, broths and delicate creamed soups.

2. main dish soups should be more substantial and more generous in portion size; they:
    a. may take the place of an entrée;
    b. may complement a salad or sandwich;
    c. include soups such as bisques, chowders, hearty cream soups, and gumbos.

C. Soup Preparation Can Be Simple or Complex.

1. May foodservices use canned soups that merely require the addition of liquid and heating.

LESSON CONTENT	CLASS ACTIVITY
2. Other foodservices use soup mixes which contain the spices, flavorings and perhaps dehydrated vegetables. The addition of liquids and perhaps diced meat or poultry is also required.	
3. Still other, more traditional operators continue to make soups from original basic ingredients which involves making the soup stock by simmering bones and vegetables for extended periods of time.	
4. For more information on making soups, see the reference Standards, Principles and Techniques in Quantity Food Production, by Lendal Kotschevar.	
D. Soup Standards Vary According to the Type of Soup.	
1. Serve hot, at or above 170°F (unless it is a cold soup).	Divide participants into pairs and assign each couple one of the recipes to prepare from Handouts #13-2 through 13-7. Use the
2. Portions vary according to use, from 6 ounces to 10 ounces.	

LESSON 13 : SAUCES, GRAVIES AND SOUPS

LESSON CONTENT	CLASS ACTIVITY
3. Flavors should be distinct, mild, pleasant, and characteristic for the soup. 4. Seasonings should be delicate, not dominant. 5. Colors can vary according to ingredients, but should be natural and pleasing. Contrasting colors are desirable. 6. The surface should show a sheen of minute globules of fat, but only a trace. Fat should never be in pools or large, round globules. 7. All particles should be bite-size. 8. There should be no curdling. 9. Not too much salt.	evaluation form on Handout #13-1, to judge the quality and acceptability of each product prepared. If a preparation kitchen is not available for participants to use, have samples of each recipe made in advance of the class and ask participants to evaluate the sample products using the same evaluation form.

Handout #13-1

EVALUATION FORM FOR SAUCES, GRAVIES AND SOUPS

SAUCES AND GRAVIES

	Sample 1		Sample 2		Sample 3		Sample 4	
	Yes	No	Yes	No	Yes	No	Yes	No
1. Soft surface sheen								
2. Smooth texture, no lumps								
3. Uncooked starch flavor								
4. Evidence of being pasty, murky or cloudy								
SOUPS								
1. Flavor distinct, characteristic								
2. Flavor mild, pleasant								
3. Seasonings delicate, not dominant								
4. Color natural, pleasing, with some contrast								

SOUP

	Sample 1		Sample 2		Sample 3		Sample 4	
	Yes	No	Yes	No	Yes	No	Yes	No
5. Surface sheen, no pools of fat								
6. All particles bite-sized								
7. Curdling evident								
8. Too salty								

Handout #13-2

COOKED BARBECUE SAUCE

no portion			Sauces 13-2
INGREDIENTS	**AMOUNT (1½ gallons)**		**PROCEDURE**
Catsup	1 No. 10 can		Combine all ingredients. Simmer 10 minutes. Baste chicken or meat with sauce during cooking.
Water	3 qts		
Vinegar	2 cups		
Salt	2 Tbsp		
Pepper	1 tsp		
Sugar	½ cup		
Chili powder	1 tsp		
Worcestershire sauce	¼ cup		
Tabasco sauce	1 Tbsp		
Onion, grated	½ cup		
Lemons, sliced	2		

NOTE: Sauce also may be used for barbecued hamburgers or to combine with beef, pork or ham slices for barbecued sandwiches.

Cost Per Serving: ____________________

Total Production Time: ____________________

9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F. Food For Fifty, 1979. 6th Edition, John Wiley and Sons, New York, New York.

Handout #13-3

UNCOOKED BARBECUE SAUCE

no portion			Sauces 13-3
INGREDIENTS	AMOUNT (1 gallon)		PROCEDURE
Catsup Vinegar Sugar Salt Onion, grated	1 No. 10 can 3 cups 12 oz 4 oz 4 oz		Mix all ingredients. Pour over spareribs, shortribs, chops, or lamb shanks. Bake.
Cost Per Serving: ____________________			
Total Production Time: ____________________			9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F. Food for Fifty, 1979. 6th Edition. John Wiley and Sons, New York, New York.

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Handout #13-4

PAN GRAVY

Sauces 10-4

INGREDIENTS	AMOUNT (1 gallon)		PROCEDURE
Fat, meat drippings, hot Flour	8 oz 8 oz		Add flour to fat and blend.
Salt Pepper	1 Tbsp 1 tsp		Add salt and pepper.
Water or meat stock	1 gallon		Add water or stock gradually, stirring constantly. Cook until smooth and thickened.

VARIATIONS

BROWN GRAVY: Use 10 oz flour and brown in the fat.

CREAM GRAVY: Substitute milk for water or stock.

GIBLET GRAVY: Use chicken drippings for fat and chicken stock for liquid. Add 1 qt cooked giblets, chopped.

ONION GRAVY: Lightly brown 1 lb thinly sliced onions in fat before adding flour.

VEGETABLE GRAVY: Add 1 lb diced carrots, 4 oz chopped celery, and 12 oz chopped onions, cooked in water or meat stock.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F. Food for Fifty, 1979, 6th Edition. John Wiley and Sons, New York, New York.

Handout #13-5

BROWN SAUCE (BEEF BASE GRAVY)

Sauces 13-5

INGREDIENTS	AMOUNT (1 gallon)		PROCEDURE
Beef stock Onion, thinly sliced Salt Pepper	1 gallon 8 oz 1½ Tbsp ½ tsp		Add onion and seasoning to meat stock. Simmer about 10 minutes. Strain.
Fat Flour	1 lb 10 oz		Heat fat and blend with flour. Cook until it becomes uniformly brown in color. Add hot stock while stirring. Cook until thickened.

VARIATIONS

JELLY SAUCE: Add 2 cups currant jelly, beaten until melted, 2 Tbsp tarragon vinegar, and 4 oz sautéed minced onions to 2 qt Brown Sauce. Serve with lamb or game.

MUSHROOM SAUCE: Add 1 lb sliced mushrooms and 2 oz minced onions, sautéed, to 2 qt Brown Sauce. Serve with steak.

OLIVE SAUCE: Add 1 cup chopped stuffed olives to 2 qt Brown Sauce. Serve with meat or duck.

VARIATIONS	
PIQUANTE SAUCE:	Add 2 oz minced onions, 2 oz capers, vinegar, ¼ cup sugar, ¼ tsp salt, ¼ tsp paprika, and ½ cup chili sauce or chopped sweet pickle to 2 qt Brown Sauce. Serve with meats.
SAVORY MUSTARD SAUCE:	Add ½ cup prepared mustard and ½ cup horseradish to 2 qt Brown Sauce. Serve with meats.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F., Food for Fifty, 1979, 6th Edition. John Wiley and Sons, New York, New York.

Hardout #13-6

NAVY BEAN SOUP

1 cup			Soup 13-6
INGREDIENTS	**AMOUNT (3 gallons)**		**PROCEDURE**
Navy beans Water, boiling	3 lbs 1½ gallons		Wash beans. Add boiling water. Cover and let stand 1 hour or longer.
Ham shanks	5 lb		Add ham shanks. Simmer until beans are cooked. Remove ham from bones, chop and add later.
Onion, chopped Celery, diced	4 oz 8 oz		Add onion, celery and water to make a total volume of 3½ gal. Cook 30 minutes. Add chopped ham. Season to taste. Heat to serving temperature.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F. Food for Fifty, 1979, 6th Edition. John Wiley and Sons, New York, New York.

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Handout #13-7

BEEF STOCK

Stock 13-7

INGREDIENTS	AMOUNT (3 gallons)		PROCEDURE
Beef shank, lean Water, cold	15 lbs 5 gal		Pour water over beef shanks. Bring to boiling point.
Onion, chopped Celery, chopped Carrot, chopped Peppercorns Bay leaves Salt	8 oz 8 oz 8 oz 1 Tbsp 2 3 oz		Add vegetables and seasonings. Simmer until meat leaves bone (about 4 hours). Remove meat, strain, cool, and skim off fat.

NOTE: A quick beef stock may be made by adding concentrated beef soup base to water in amounts given in manufacturer's directions. When using this stock for sauces for casseroles, reduce salt by 1 Tbsp per gallon of sauce.

VARIATIONS

ALPHABET BEEF VEGETABLE SOUP: To 3 gallons Beef Stock, add 3 lb freshly ground beef, 5 oz chopped celery, 5 oz chopped carrots, 3 oz chopped onions, 12 oz peas, and 8 oz rice (if desired). Cook until ingredients are tender. Serving: 1 cup.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F. Food for Fifty, 1979, 6th Edition. New York, New York.

LESSON 14 : VEGETABLES

A. GOAL OF THIS LESSON

The goal of this lesson is to develop an understanding of the principles of fresh, canned and frozen vegetable cooking.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. be aware of the available selection and purchasing options;
2. be aware of a variety of ways to make vegetables appealing to the customer;
3. understand the principles of preparing canned, fresh and frozen products;
4. be aware of seasonings that complement vegetables.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate the necessary handouts.
2. At least 10 weeks before showing, locate and arrange for the film to be shown for this lesson.
   a. "Vegetable Preparation," Order Number 1-1749, State of Michigan Library, (P. O. Box 3007, Lansing, MI).
3. If food preparation is to be done, order food, write production order, arrange for kitchen facilities.

LESSON 14 : VEGETABLES

D. KEY WORDS USED IN THIS LESSON

ANTHOCYANINS: soluble glucoside pigment in some vegetables producing blue to red coloring.

CAROTENE: orange or red crystalline pigments found in plants and fatty tissues of plant eating animals that is convertible to Vitamin A.

CHLOROPHYLL: the green coloring pigment of plants.

DEHYDRATED VEGETABLES: are vacuum dried, producing a product that has 2½ to 5½ moisture content.

DRAINED WEIGHT: weight of a canned product after the liquid content has been allowed to drain for 2 minutes on screen.

FLAVONAL: any of the various hydroxy derivatives of flavones pigment.

FREEZE DRIED VEGETABLES: vegetables that have been flash frozen and then 98% of the moisture removed. Usually weighs about ^{1}/10th of the original weight.

NET WEIGHT: weight of a canned product plus liquid.

PERFORATED PAN: a pan that has holes in it to permit steam to circulate through the contents.

VEGETABLE: a plant that is grown for the edible portion--leaf, seed, tuber, fruit, stem, shoot or flower.

LESSON 14 : VEGETABLES

E. REFERENCES

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LESSON 14 : VEGETABLES

LESSON CONTENT	CLASS ACTIVITY
I. **INTRODUCTION**	
A. Vegetables Are Plants Grown For Their Edible Leaves, Seeds, Tuber, Roots, Bulbs, Fruits, Stems, and Shoots or Flowers.	
1. Vegetables are not the most popular item on the menu.	
2. Frequently they are not liked because they are overcooked, underseasoned and have no eye appeal.	
3. The main objective in cooking vegetables is to have good flavor, natural color, tender, crisp product with little nutritive loss.	
4. Most vegetables are leaves, seeds.	
5. Handout #14-1, vegetables as part of a plant, identifies the vegetables by the part of the plant they come from.	Handout #14-1 can be used as a discussion of the various available vegetables and how they could be used in the program.
B. The selection of vegetables served is determined by factors:	
1. equipment available (freezer, steamer)	

LESSON CONTENT	CLASS ACTIVITY
2. budgetary allowances 3. student preference II. FORM OF VEGETABLES OFTEN USED IN SCHOOL FOOD SERVICE A. Canned 1. Is easily stored; 2. Is easily prepared and served; 3. Is likely to be the least expensive of all forms; 4. Needs care to only reheat; 5. Overcooking causes soft texture, poor flavor, unattractive product. B. Frozen 1. Popular with participants; 2. Requires freezer space and sufficient equipment to prepare; 3. Can be cooked from the frozen state.	

LESSON CONTENT

CLASS ACTIVITY

C. Fresh

1. Seldom used for cooking because of availability, price and labor hours in preparation.
2. Are included in salads, relishes and snacks.
3. Where possible try to add more servings.

D. Dehydrated

1. Moisture has been removed from the vegetable.
2. Can be stored at room temperature.
3. Products most often are:
    a. potatoes; flakes, granules diced, sliced
    b. onions
    c. celery
    d. green pepper

E. Freeze dried

1. Are dehydrated vegetables
2. Products have original flavor and quality to a greater degree than dehydration process because cellular structure is left intact.

LESSON CONTENT	CLASS ACTIVITY
F. Dried	
1. Dried legumes are available.	
2. Can be a cost saver.	
3. Produces dishes that are attractive, flavorful and nutritious.	
4. Some dried legumes are:	
a. peas	
b. black-eyed peas	
c. soybeans	
d. navy, pinto, lima and kidney beans	
III. PURCHASING OF VEGETABLES	
A. Choices Are Determined By Many Factors:	
1. participants preferences	
2. budget	
3. equipment and space:	

LESSON CONTENT **CLASS ACTIVITY**

a. storage area, such as freezers, storeroom, refrigerators

b. cooking equipment such as top or range, steam-jacketed kettle, tilt-fry pan

4. number of people being served

B. Considerations for Purchasing Canned Products:

1. Canned vegetables are available in:

can size	wt.	no. per case
10	6#-7# 5 oz	6
303	16-17 oz	24 or 36
3-cylinder	51 oz	12

2. Quality Grading

a. Grade A-Fancy

b. Grade B-Extra standard

c. Grade C-Standard

3. Selection should be made according to the use of the product. Fancy whole tomatoes are not needed if the tomatoes are to be used in home-made soup or spaghetti sauce.

LESSON CONTENT	CLASS ACTIVITY
C. Considerations for Purchasing Frozen Vegetables 1. Quality grading is same as the grading for canned vegetables a. Grade A-Fancy b. Grade B-Extra Standard c. Grade C-Standard 2. Package sizes likely to be used in food service program: a. 40 oz carton packed 12 to a case--most vegetables b. 32 oz pkg--vegetables that are more perishable, such as cauliflower, broccoli, brussel sprouts D. Considerations for Purchasing Fresh: 1. can be purchased by case, pound or piece 2. varies with the supplier and the needs of the school	

LESSON CONTENT	CLASS ACTIVITY

E. Considerations for Purchasing Dehydrated or Freeze Dried:

1. packaging form varies with the product:
    a. for example, 1# dehydrated onions equals 8 pounds of fresh prepared
    b. may be purchased in 3 bags or No. 10 cans
    c. 50# bag dried onions equals 3 No. 10 cans or 3-1^3/4 bags
2. potatoes are often purchased in these forms:
    a. for mashing, flakes or granules are available
    b. some products have nonfat dry milk solids added
    c. evaluate the product and compare with other brands to see if you are getting the desired results

LESSON 14 : VEGETABLES

LESSON CONTENT	CLASS ACTIVITY
d. dried and sliced potatoes are available in polyethylene bags or No. 10 cans	
e. store in cool place	
3. onions, green pepper, parsley are packaged in 20 oz to 3# packages and No. 10 cans	
IV. **EFFECTS OF COOKING**	
A. Nutritive Value	
1. Reduce loss of minerals and vitamins if fresh and frozen vegetables are started in boiling water and the vegetables are in large pieces.	Use Handout #14-2 to discuss nutritive value.
2. Limited Vitamin A losses because carotenoids are insoluble in water and are resistant to oxidation.	
3. High temperatures of steam at 5# pressure has fewer losses than cooking in boiling water because of the shorter cooking time.	
4. Ascorbic acid and Vitamin B are soluble in water and losses can be expected. Reduce time vegetables just soak in water.	

LESSON 14 : VEGETABLES

LESSON CONTENT

B. Changes in Vegetable Color During Cooking

1. Green vegetables with chlorophyll, the color pigment
    - a. is affected by long cooking times
    - b. turns a brownish color with intense heat, acid and minerals
2. Yellow orange
    - a. not changed very much in cooking
    - b. sugar content carmelizes when held on steam table too long (carrots)
3. Red vegetables
    - a. lose color in water (beets)
    - b. color changes of the vegetable especially red cabbage, depending on water
        - (1) alkali in hard water turns vegetables bluish

CLASS ACTIVITY

Handout #14-2 has in chart form what happens to the pigments of vegetables as a result of cooking.

LESSON CONTENT	CLASS ACTIVITY
(2) acid in water causes vegetables to become brighter	
4. White vegetables	
a. discolor in vegetable juices	
b. turn yellow in alkaline or hard water	
c. maintain the white color by covering the cooking vessel	
C. Effects of Cooking On Flavor and Palatability	
1. Some strong flavored vegetables such as onions and cabbage lose their undesirable flavor in steam when cooked in open kettle.	
2. Hardness of the water and presence of salt may cause calcium and magnesium to dissolve in the water and combine with the cellulose of the vegetable thus hardening the structure.	

LESSON CONTENT

V. GUIDES FOR COOKING VEGETABLES

A. Canned Vegetables

1. Heat only. It is not appropriate, however, to place vegetables in a counter-pan, season and then place on the counter until serving time.

2. To heat:

   a. drain liquid from No. 10 can retaining 1 cup

   b. heat the one cup of liquid

   c. season

   d. bring to boil

   e. add vegetable

   f. reduce heat and simmer until vegetable is heated

CLASS ACTIVITY

Show the 16 mm film, "Vegetable Preparation." This color film is excellent and gives basic information about cooking fresh and frozen vegetables.

LESSON 14 : VEGETABLES

LESSON CONTENT	CLASS ACTIVITY
B. Fresh or Frozen Vegetables	
1. Cook for as short a time as possible	
2. Do not add baking soda to retain color	
3. Cook in small batches	
4. Avoid holding temperatures for long periods of time	
5. Do not leave chopped, shredded or cut vegetables to stand uncovered	
6. Use steam whenever possible	
VI. CREATIVITY IN PREPARATION AND MENU WRITING	Handout #14-4 will provide ideas for food preparation classes as well as the demonstration class.
A. Try Combinations of Foods	
1. Creamed potatoes with peas or green onions or both	
2. Corn with lima beans which is called succotash	

LESSON 14 : VEGETABLES

LESSON CONTENT | **CLASS ACTIVITY**

3. Eggplant with tomatoes, green pepper and cheese

4. Carrots and green onions

5. Green beans and corn with tomato sauce

B. Use Seasonings to Enhance Flavor

Handout #14-5. Seasoning suggestions helpful to the class that is preparing the foods.

1. Use only one or two.

2. Horseradish with beets--or with applesauce

3. Lemon, nutmeg, or oregano with broccoli

4. Basil, caraway, rosemary with cauliflower

5. Onions are complementary with the use of basil, ginger, mustard, sage, paprika.

C. Try Stuffed Vegetables By Using the Vegetable as the Container for the Second Item:

Container	Filling
peppers	chicken salad
tomatoes	tuna salad

LESSON CONTENT	CLASS ACTIVITY

Container	Filling
onions	rice/vegetable and meat
squash acorn or zucchini	macaroni sausage

VII. MERCHANDISING VEGETABLES

A. Provide a Vegetable Plate.

1. Give a choice similar to the salad bar.

2. Predetermine the selection.

B. Be Sure the Counter Is Attractive.

C. Do Not Use Deep Counter Pans.

1. Vegetables do not keep good shape in the bottom of the pan.

2. They lose eye appeal.

D. Conduct a Prize Rewarding Game.

1. The 60th person asking for a serving of creamed spinach receives an extra bottle of milk, or sloppy joe.

2. Brainstorm for other ideas.

Handout #14-1

PARTS of PLANTS COMMONLY USED as VEGETABLES

LEAVES

Brussel sprouts
Cabbage
Chard
Chinese Cabbage
Collards
Dandelion
Endive
Kale
Lettuce
Mustard
Parsley
Spinach
Turnip Greens
Beet Greens
Watercress

SEEDS

Beans
Peas
Lentils
Corn

TUBES

Artichoke (Jerusalem)
Potato (Irish)

ROOTS

Beets
Carrots
Parsnip
Potato (sweet)
Radish
Rutabaga
Salsify
Turnip

BULBS

Chives
Garlic
Leeks
Onion
Shallot

FRUITS

Cucumber
Eggplant
Melons
Okra
Pepper
Pumpkin
Squash
Tomato

STEMS & SHOOTS

Asparagus
Celery
Kohlrabi

FLOWERS

Artichoke (French or Globe)
Broccoli
Cauliflower

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Handout #14-2

NUTRITIVE VALUE OF VEGETABLES

Vegetables that Contain Vitamin V and C

VITAMIN A

Asparagus
Broccoli
Carrots
Chili peppers
(red)
Kale
Mixed vegetables
Peas and carrots
Pumpkin
Spinach
Squash-Winter
Sweet potatoes
Tomatoes
Tomato juice,
paste or puree
Turnip greens
Vegetable juices

VITAMIN C

Asparagus
Broccoli
Brussel sprouts
Cabbage
Cauliflower
Chili peppers
Collards,
Kale
Okra
Peppers, sweet
Potatoes, white
Spinach
Sweet potatoes
Tomatoes
Tomato juice,
paste or puree
Turnip greens
Turnips

What are some preparation choices? All vegetables can be cooked to perfection and dressed with small amount of butter or margarine. Other options include:

GREEN

Bean, green
  baked
  creole
  sausage/mushrooms
  water chestnuts or
  chopped apples or
  chopped potatoes

Broccoli
  cheese sauce

Brussel sprouts
  sweet & sour

Peas
  w/ mint & orange rind
  w/ onions

Spinach
  rice and cheese
  onion

Zucchini
  with carrots
  with cheese
  with tomato

YELLOW

Carrots
w/brown sugar & nutmeg
creamed
w/green grapes
ginger
honey glazed
w/celery

Corn
w/green beans
olé (gr. beef,
noodles, corn,
tomatoes)
scallo[illegible]/zucchini

Rutabaga
with apple
mashed with carrot
patties

Squash
baked
acorn baked/blueberries
acorn baked/pineapple
acorn baked/sausage

Sweet potatoes
baked/apple
biscuits
orange glaze
pie

Handout 14-3

CHANGES IN VEGETABLE COLOR DURING COOKING

	GREEN	YELLOW-ORANGE	RED	WHITE
Name of Pigment of Vegetables / Effective Medium or Action	CHLOROPHYLL	1) CAROTENE 2) XANTHOPHYLL 3) LYCOPIN	ANTHOCYANINS	1) FLAVONES 2) FLAVONOLS (WHITE - Yellowish)
SOLUBILITY IN WATER	Slight	Slight	Very Soluble	Very Soluble (If water is hard, add 1 T water per gal. of water)
EFFECT OF ACID	Changes to olive green	Little effect	Stable in acid. Usually add vinegar	White
EFFECT OF ALKALI	Intensifies green color	Little effect	Blue, green or brown	Yellow
EFFECT OF PROLONGED HEATING OR HOLDING ON STEAM TABLE	Yellow-green Olive green color Brown	Little effect but darkens when excessive - sugar in vegetable carmelizes	Little effect	Darkens if excessive

Handout 14-4

VEGETABLES - FOR VARIETY, VITAMINS, VIGOR, VITALITY FOR MINERALS, MUNCHING, MENU GLAMOUR

Nutritional Value: vegetables as a group contribute bulk, fiber, minerals and vitamins to the diet. Most vegetables are low in calories and high in water content.

Forms to Purchase:
Canned - only needs heating not cooking
Fresh - has maximum nutritive value and can be a low calorie snack
Frozen - resembles fresh, allows variety all year long
- do not overcook, no need to thaw before cooking but once thawed, do not refreeze as it reduces acceptability and quality.

What are some preparation choices? All vegetables can be cooked to perfection.

GREEN

Bean, green
  baked
  creole
  sausage/mushrooms
  water chestnuts or
  chopped apples or
  chopped potatoes

Broccoli
  cheese sauce

Brussel sprouts
  sweet & sour

Peas
  w/mint & orange rind
  w/onions

Spinach
  rice and cheese
  onion

Zucchini
  with carrots
  with cheese
  with tomato

YELLOW

Carrots
  w/brown sugar & nutmeg
  creamed
  w/green grapes
  ginger
  honey glazed
  w/celery

Rutabaga
  w/apple
  mashed with carrot
  patties

Squash
  baked
  acorn baked/blueberries
  acorn baked/pineapple
  acorn baked/sausage

Sweet potatoes
  baked/apple
  biscuits
  orange glaze
  pie

Handout 14-4 cont.

Corn
  w/gr beans
  ole (gr beef, noodles,
    corn, tomatoes)
  scalloped w/zucchini

WHITE

Cabbage
  slaw

Cauliflower
  w/cheese sauce
  w/nuts
  w/parsley

Parsnips
  w/orange sauce
  candied

Turnips
  mashed
  orange sauce
  scalloped

Potatoes
  browned in skin
  cakes
  creamed
  golden
  hash-brown
  mashed
  pancakes
  scalloped

RED

Beets
  w/apples
  harvard
  orange
  spiced
  w/pineapple
  in lemonade sauce

Tomatoes
  creole
  scalloped
  stewed
  w/beans
  w/corn

* * * * * * * * * * * * * * * * *

VEGETABLE COMBINATIONS - after cooking or last few minutes of cooking

creamed potatoes with peas, or green onions or both
green beans with stewed tomatoes and green pepper
carrots with celery or rutabagas or cauliflower
corn with lima beans (succotash)
eggplant with tomatoes, green pepper and cheese

* * * * * * *

Vegetables can be used as a serving container and vegetable - Peppers, tomatoes, onion, acorn and zucchini squash are some vegetables that can be scooped out and centers filled with flavorful meat or rice fillings and vegetable pulp.

VEGETABLES AS AN ENTREE -

Vegetable Platter -	stuffed eggplant, grilled tomatoes, julienne potatoes
hot	spinach ring, poached eggs, green peas, scalloped tomatoes, carrot loaf, scalloped rice and tomatoes, Boston baked bean, au gratin cauliflower, sliced tomatoes, carrot ring with buttered peas, fried tomatoes and onions, Turkish pilaf, spinach supreme, tomatoes and celery.
cold	tossed salad, deviled egg, relishes, cabbage slaw with pineapple bits, sliced tomatoes, carrot and turnip coins tomato stuffed with chicken salad or tuna salad relishes, quick bread sandwiches

* * * * * *

HANDOUT #14-5

SEASONING SUGGESTIONS FOR SERVING VEGETABLES

Vegetable appeal can be enhanced by herbs, sauces, spices, garnishes, and imaginative combinations. Try combinations such as the following:

Asparagus or broccoli with mock hollandaise sauce.

Asparagus, carrots, cauliflower, and green peas in butter sauce made with thickened vegetable liquid.

Beets, spiced, simmered in cranberry sauce.

broccoli with hot lemon mayonnaise.

Brussels sprouts, celery, green beans, slivered almonds, baked in tomato sauce with grated cheese.

Brussels sprouts with browned butter sauce or cheese-vegetable rarebit.

Butternut or Hubbard squash in orange butter

Cabbage and onions seasoned wtih bacon fat and garlic salt and combined with canned tomatoes.

Cabbage cooked with celery salt and onion salt.

Carrot slices and pineapple tidbits cooked in butter sauce flavored with pineapple juice.

Carrots, celery crescents, corn kernels, pineapple tidbits, chopped parsley, and flaked coconut.

Cauliflower and green peas in lemon butter.

Corn, chopped green onions and parsley in light cream, topped with grated cheese and baked until bubbly.

Eggplant creole with allspice.

Eggplant, tomato, and sliced onion with Parmesan crumbs.

Green beans and whole kernel corn in tomato sauce.

Green beans creole with pinch nutmeg, onion salt, and bay leaf.

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Handout 14-5 cont.

Green beans in white sauce sparked with chipped beef bits.

Green beans, radishes, water chestnuts, mushrooms, onions, pimiento, and dill seed.

Green lima beans cooked in chicken broth with a hint of curry.

Green lima beans with creole or mustard sauce.

Onions creamed with a dash of nutmeg and celery salt.

Parsnips, julienne carrots, cauliflower, celery, mushrooms, pimiento, and chives.

Peas, green, and carrots with dill seed.

Peas, green, onions, and chopped pimiento.

Sauerkraut, diced apples, brown sugar, celery seed topped with crisp bacon bits and baked.

Spinach baked in sauce with croutons.

Spinach, partially cooked, baked in cheese sauce.

Tomatoes and green beans flavored with chopped green pepper and chili powder and sprinkled with bacon bits.

Tomatoes stewed with basil.

Zucchini squash, carrots, and corn kernels in crisp tart shells.

Zucchini squash, diced carrots or celery with herbed butter.

Adapted from: Quantity Recipes for Type A School Lunches. (PA-631) (USDA, Food and Nutrition Service) Washington, D.C.: U.S. Government Printing Office, 1971.

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LESSON 15 : GELATIN SALADS AND SINGLE SERVING SALADS

A. GOALS OF THIS LESSON

The goal of this lesson is to understand the basic principles of making gelatin and other individual salads.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. understand the principles of preparing salad ingredients.
2. identify a variety of salad dressing and compare home-made and commercial.
3. know how to make quality gelatin salads.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate materials needed for class.
2. If food is to be prepared, order the food, write production work sheet.
3. If food demonstration is to be done, order and prepare food.

D. KEY WORDS USED IN THIS LESSON

GELATIN: an incomplete protein obtained from hoofs, horns and connective tissue of animals. It swells to a jelly-like mass in cold water and dissolves in hot water.

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DRESSINGS: a form of sauces that are blended and combined to season foods with which they are served.

E. REFERENCES FOR ADDITIONAL INFORMATION

LESSON 15: GELATIN SALADS AND SINGLE SERVING SALADS

LESSON CONTENT	CLASS ACTIVITY
I. INTRODUCTION Salad should be selected to balance the rest of the meal. It should be simple, palatable, colorful, and have a whisper of seasonings. A. Basic Four Kinds of Salad: 1. Protein 2. Vegetable--cooked and greens 3. Fruit 4. Gelatin B. Dressings and Garnishes Are Also Important Parts of the Salad. They add both flavor and color.	The material in this lesson can be used with demonstration or cooking in class. The selection of how to use the material will be largely due to the participants' needs and backgrounds.
II. FOUR BASIC PARTS TO A SALAD A. Base: usually lettuce or some form of salad green B. Body: the ingredients that constitute the salad itself 1. often the choice of ingredients that give the salad its name;	Use Handout 15-1, Things You Should Know About Salad Greens. This handout provides good discussion about the variety of greens available and cost. Good guide for planning working lab.

LESSON 15 : GELATIN SALADS AND SINGLE SERVING SALADS

LESSON CONTENT	CLASS ACTIVITY
2. can be a variety of ingredients and arrangements. C. Dressing: should bear a direct relationship to the salad 1. can be mixed with the body; 2. can be served on the side. D. Garnish: 1. is the finishing touch to the salad which aids in creating eye appeal through contrast and harmony of color and ingredient; 2. should be simple so as not to distract from the salad yet contrasting and effective enough to attract attention; 3. the flavor and texture should be related to the salad. III. GUIDELINES FOR MAKING A GOOD SALAD A. Buying and Handling Ingredients To Produce a Good or Excellent Salad	

LESSON 15 : GELATIN SALADS AND SINGLE SERVING SALADS

LESSON CONTENT	CLASS ACTIVITY
1. Use fresh, high quality ingredients;	
2. Choose ingredients for compatibility of flavors, textures and colors;	
3. Plan the recipe carefully in terms of height, color and unity;	
4. Keep it simple.	
B. General Rules In Preparation	Use Handout 15-2, Basic Cole Slaw. This handout shows a wide range of choices for giving an old stand-by a new flair.
1. Refrigerate all salad materials and completed salads at all times except during making.	
2. Wash vegetables with great care for they are eaten raw.	
3. Use sharp knives--dull knives crush instead of cut.	
4. If time permits, break lettuce instead of cutting; the point of contact with a knife will brown the lettuce.	
5. Ascorbic acid--lemon juice and pineapple juice--will prevent fruit from turning dark.	

LESSON 15 : GELATIN SALADS AND SINGLE SERVING SALADS

LESSON CONTENT	CLASS ACTIVITY

Another item that will do the same thing is lemon pudding mix, which adds flavor and tends to thicken.

6. Greens should be washed well and drained; salad dressing will not adhere to wet greens.

IV. CONGEALED SALADS

A. Simple Preparation Techniques Important In Making a High Quality Gelatin Product:

1. Use only high quality gelatins that have bright sparkle, clean color, good setting ability and a true, pleasing flavor.

2. Gelatins vary in setting strength but normally a 2% solution gives a satisfactory gel.

3. Sugar increases the firmness of a gel, while acids decrease it.

4. Chopped ingredients weaken a gelatin structure.

5. Gelatin sets at from 48°F to 57°F.

    a. Cool slowly to 100°F and then refrigerate until the mixture is 40°F; this takes from 1½ to 2 hours but gives a firmer product than rapid setting.

LESSON CONTENT	CLASS ACTIVITY

b. For rapid setting, add a fourth or one-half the liquid to dissolve gelatin and then add crushed ice in a measure filled with water to give the additional liquid required. Stir the ice until melted.

6. Plain gelatin must be soaked in cold liquid for about 5 minutes before dissolving it. To dissolve it, gelatin goes into solution at 100°F slowly, but normally 170°F or higher will obtain a more rapid solution.

7. Uncooked pineapple, figs, papaya and a few other fruits contain enzymes that digest gelatin so they must be cooked before being used with gelatin mixtures.

8. If a gelatin mixture sets partially before ingredients are added, they usually will not float on top.

9. Bananas and cabbage float when added to gelatin salad, while canned fruit tends to sink.

B. Basic Formula for Preparing Gelatin Product

1. To one gallon of liquid, add a 24 oz fruit-flavored gelatin; one-half of the liquid should be hot.

LESSON 15 : GELATIN SALADS AND SINGLE SERVING SALADS

LESSON CONTENT	CLASS ACTIVITY
2. To one gallon of liquid, add 3½ oz of plain gelatin soaked in a small quantity of water.	

Handout #15-1

THINGS YOU SHOULD KNOW ABOUT SALAD GREENS

TYPE	CHARACTERISTIC	BUYMANSHIP	COMBINATION	PRODUCTION	STORAGE TEMP.
CRISP HEAD LETTUCE	Firmness of head Crisp texture	Fresh, crisp, tender and fairly firm. Free from decay and should not have an excess of outer or wrapped leaves.	Serve as a slice, half or quarter with dressing. Combines with other greens, vegetables or fruits.	Winter: CA, AZ, TX, FL. Early Spring: CA, AZ, NM, NC, SC. Late Spring: CT, NJ, PA, MA, WA, OR. Summer: ME, NY, OH, MI, WI, CO, CA. Early Fall: CA, NJ, TX, NM, WA, OR. Late Fall: AZ	32°
BUTTERHEAD BIG BOSTON WHITE BOSTON	Soft head, inner leaves feel oily or buttery	Heads should be fairly firm.	Excellent in tossed green salads and as garnish		32°
BIBB } LETTUCE	Small, cup-shaped head, firm, distinct color, flavor, crispness. Leaves deep green, sweet, tender.		Small enough for single serving and a simple French or Russian dressing.	Middle West August, May	32°

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Handout #15-1/Page 2

TYPE	CHARACTERISTIC	BUYMANSHIP	COMBINATION	PRODUCTION	STORAGE TEMP.
COS OR ROMAINE	Elongated head, stiff leaves. Leaves somewhat coarse, sweet, good quality. Flavor sharp, butternut.	Plants are fairly well-headed, well trimmed, free from decay and damage.	Retains it crispness when used in tossed salads and as garnish.	12 months in California	32°
LEAF OR BUNCHING LETTUCE	Loose, non-head forming leaves, delicate flavor.	Leaf lettuce plants. Similar varietal characteristics. Well-formed and decay free.			32°
ENDIVE	Narrow, finely divided curly leaves, slightly bitter taste.	Crispness, freshness and tenderness.	Use in salads.	Winter: FL, CA Summer: NJ, OH, CA	32°
ESCAROIE	Broad leaves, well-branched.	Crispness, freshness and tendernass.	Use in salads.	Same as for ENDIVE.	
CHICORY	Tightly folded plant. Grows upright in a thin stalk.	Crispness, freshness and tenderness	Use in salads,	Winter: FL, CA Summer: NJ, OH, CA	32°

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Handout #15-1/Page 3

TYPE	CHARACTERISTIC	BUYMANSHIP	COMBINATION	PRODUCTION	STORAGE TEMP.
FRENCH ENDIVE	Blanched chicory	Crispness, freshness, tenderness	Use in salads	Winter: FL, CA Summer: NJ, OH, CA	32°
MUSTARD GREENS	Young, tender, large, broad, smooth leaves, toothed margins, & large, curly leaves.	Fresh, tender-crisp, good green color	Used as salad leaves either alone or mixed with other greens	Available year-round in various parts of the U.S.	40°
PARSLEY (1)CURLED LEAF	Large, dark green, compact habit				
(2)PLAIN LEAVED	Leaves plain, deeply cut, flat, not curled	Bright green, fresh & free from dirt & yellow leaves	Chopped & mixed in salads	TX, CA, NJ, FL, NY	Refrigerated & moist
(3)CELERY LEAVED					
WATER-CRESS	Roundish leaflets, slender stalks, peppery taste	Dark green, dainty leaves, crisp and rather long stems	Mix with other greens, or alone	12 mos. in CA	32°
CABBAGE CHINESE	Hard heading type; Petsal		Use in salads	MI, OH, & Midwest States; CA & FL	32°
CELERY	Loose open-type; Pake-choc. Long firm tapering heads, pale green leaf, white inside				

Handout #15-1/Page 4

TYPE	CHARACTERISTIC	BUYMANSHIP	COMBINATION	PRODUCTION	STORAGE TEMP
SPINACH SAVOYED OR CRUMLISH LEAF	Arrow-shaped, radical leaves	Freshness, crispness, clean, good color, free from decay	Tender leaves good in salads	Winter: CA, TX Spring: MA, CT, NY, NJ, PA, OH, MO, MD, VA	32°
RED LETTUCE	Loose, non-head, reddish-bronze leaves	Similar varietal characteristics which are well-grown. Well-trimmed and free from decay.	Very tender leaves. Good for tossed green salads & garnishes	CA--Every month except April	32°

Handout #15-2

BASIC COLE SLAW

Cabbage, shredded	7 lbs (7 qts)
Mayonnaise	$^3/4$ qt
Lemon juice, fresh	$^1/3$ cup
Salt	2 Tbsp
White pepper	1 tsp
Powdered mustard	1 tsp
Sugar	2 tsp

PROCEDURE: 1. Crisp cabbage in ice water. Drain thoroughly. 2. Combine mayonnaise, lemon juice and seasonings. Pour over cabbage, toss to mix. 3. Refrigerate 1 hour to marinate cabbage in dressing. Turn cabbage over occasionally to marinate evenly.

VARIATIONS OF BASIC SLAW

SLAW VARIATION	SUBTRACT	ADD	AND/OR
Technicolor slaw	1 $\frac{3}{4}$ lbs cabbage	2 cups radish slices 2 cups carrot strips 2 cups green or red pepper strips 1 cup diced onion	
Radish Cole Slaw	1 $\frac{3}{4}$ lbs cabbage	1 $\frac{3}{4}$ qts radish slices	
Red and White Slaw			As cabbage, use 3½ lbs white cabbage; 3½ lbs red cabbage

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Handout #15-2/Page 2

SLAW VARIATION	SUBTRACT	ADD	AND/OR
Grape slaw	1 $\frac{3}{4}$ lbs cabbage	1 $\frac{3}{4}$ qts halved, seeded red grapes	
Nut slaw			Sprinkle 1 Tbsp chopped nuts on each portion of basic slaw
Savory Slaw Deluxe	1 $\frac{3}{4}$ lbs cabbage, the mayonnaise, lemon juice & seasonings.	1 $\frac{3}{4}$ qts green pepper strips	Toss with 1½ C oil & vinegar dressing mixed with 3 Tbsp caraway seed
Spicy Fruit Slaw	3 lbs cabbage	2 qts fresh pineapple slivers, 1 qt chopped parsley	Sprinkle a little crushed red pepper over top of each portion
Citrus Slaw			Garnish each portion of basic slaw with 2-3 section of orange
Rose Slaw	1½ C mayonnaise $\frac{1}{3}$ C lemon juice	2 C. diced onion 1½ C. sour cream	Top each with a radish rose.

Handout #15-2/Page 3

SLAW VARIATION	SUBTRACT	ADD	AND/OR
Fruited Slaw	3½ lbs cabbage	1½ qts orange slices; 1 qt diced apples; 1 qt pineapple chunks	
Rainbow Slaw	2 lbs cabbage	1 qt finely shredded carrots; 1 qt finely sliced green pepper	As cabbage, use: 2½ lbs green cabbage 2½ lbs red cabbage
Pepper Slaw			Garnish each portion of basic slaw with 2 green pepper rings
Mexican Slaw	3 lbs cabbage	1½ qts onion rings 1½ qts orange sections	Garnish each portion with sprigs of parsley
Apple 'N Grape Slaw	3 lbs cabbage	2 C. chopped nuts 1 qt halved, seeded grapes; 1½ qts apple wedges	
Red, White and Green Slaw			As cabbage use: 3½ lbs red cabbage; 3½ lbs green cabbage. Garnish each portion with chopped parsley.

Handout #15-2/Page 4

SLAW VARIATIONS	SUBTRACT	ADD	AND/OR
Sour Poppy Slaw	1½ C mayonnaise 1/3 C lemon juice	1½ C sour cream 1/3 C Poppy seeds	
Carrot Slaw	3½ lbs cabbage	3½ qts shredded carrots	
Wilted Cabbage Slaw	Mayonnaise, lemon juice & seasonings	2 C hot oil and vinegar dressing	Garnish with chopped parsley
Raisin Apple Slaw	3 lbs cabbage	1 qt raisins 2 qts sliced apples	

Yield: 1 gallon
32½ cups (portions)

Handout 15-3

SALAD PREPARATION AND SUGGESTIONS

"Salads offer eye appeal and sales appeal."

No item on the menu is as versatile as the salad. It may appear as a tempting starter, an accompaniment to the meal, as a most acceptable dessert served alone or with cheese.

Almost every good item may be used with a suitable dressing and the right arrangement to make a most attractive salad.

GENERAL RULES

1. All ingredients should be FRESH, CRISP, COLD, DRY and CLEAN.
2. Refrigerate all salad materials and completed salads at all times except during making.
3. A salad served as a main course taking the place of a main dish should be large and substantial. One served as an accompaniment to a meal may be smaller to supplement the main dish.
4. Use solid, firm, fresh fruits and vegetables.
5. Choose fruits at their prime ripeness for flavor.
6. Prepare as near serving time as possible.
7. Wash vegetables carefully for they are eaten raw. Use clean stiff vegetable brush.
8. Freshen vegetables in ice water only until crisp.
9. Drain all ingredients well.
10. Use good sharp tools. Dull knives crush rather than cut.
11. Cut vegetables on a cutting board. Sharp French knife is a great aid.

12. Use scissors to cut and trim leafy vegetables.

13. Greens for the salad should be selected with care.

The lettuces are comprised of the:
Ice Berg or Head Lettuce for its crispness.
Simpson or Grand Rapids leaf lettuce with its frilled light green leaves.
Bibb or Limestone Lettuce for its velvety texture, flavor and delicate leaf.
Romain, a slender, graceful lettuce.

The greens with deep color that may be added are:
Watercress with its pungent flavor and rich, deep green color.
The young tender leaves of spinach, mustard, chard and dandelion.
Tiny new nasturtium leaves, escarole and endive.

All these varieties of greens and lettuce may be used in the green salad. They complement each other in flavor, texture and color.

Care of the Greens

1. Procure only the best and freshest of greens.
2. Carefully clean and sort greens. Wash and drain thoroughly. Keep refrigerated at all times.
3. Have all ingredients clean and checked before assembling the salad.
4. Dry greens well. Tear or cut with shears. Do not bruise.
5. Dress salad at the last possible moment. Handle greens with a light touch when dressing. Add just enough dressing to delicately coat the greens.
6. Place in well-chilled salad bowls or plates for serving.

14. Materials should be cut in large enough pieces to retain their identity.
Exceptions: Cabbage is best shredded very fine.
Hard to chew or tough vegetables should be cut or chopped fine.

15. Gelatin salads have as a base a tart fruited gelatin powder or a gelatin with an added tart flavor. Gelatin should be stiff but not tough and rubbery.

16. Prepare salads as needed. Use assembly line for speed when serving large groups.

17. Refrigerate prepared vegetables in vegetable bags or air tight containers.

18. Keep salads simple.

19. Consider combinations of color, flavor and texture.

20. Do not flatten lettuce leaves. A leaf-cup is more attractive.

21. Pile ingredients high and lightly.

22. Do not over do garnishes. Garnishes should be edible.

23. Salad dressing--select ingredients with care.
Be sure oil is fresh.
The acid may be cider, wine, tarragon or herb flavored vinegar, lemon juice, or lime juice or part vinegar and part lemon juice.
Selection of oil, vinegar and other seasonings, should be used to bring out the flavor of the salad ingredients.

24. Add salad dressing just before serving. Dressing tends to wilt vegetables.
Exceptions: Chicken, meat, fish, cooked vegetables may be marinated.
Drain well before mixing.
Chicken, meat, fish and potato salad improve on standing in salad dressing

25. Mayonnaise dressing is best for fish, meat and poultry salads.

26. French or cooked dressings are best for fruit or vegetable salads.

27. Whipped cream blends well with cooked dressing. Whipped sour cream adds flavor to salad dressings.

28. Serve salad dressing separately or on side whenever possible. Many guests prefer small amount and some none.

29. Serve salads neatly on chilled plates.

30. Serve adequate size serving of salad and salad dressing.

SUGGESTIONS FOR SELLING SALADS

1. Dramatize the description of the salad.
   a. On the menu

2. Use colorful pictures of salads.
   a. Attach to menu
   b. Posters

3. Pass a variety of salads allowing patrons to choose their own.
   a. Salads may be passed on a tray.
   b. Salads may be placed on a cart and pushed to the patron's table.

4. Display salads - refrigerated
   a. In a case near the entrance
   b. In the window
   c. On counter

5. A salad bar from which salads are made attracts attention and lets customer know that salads are freshly made.

GARNISHES FOR SALADS

Bacon bits, cooked crisp
Beets, slices or julienne
Carrot curls or sticks
Celery curls, celery hearts
Cheese American, Swiss - julienne, bar, sliced, shredded
Cheese balls - American, cottage, or cream-rolled in nuts, chopped parsley, chives, coconut, or paprika
Cheese bars - rolled in nuts or chopped parsley
Coconut - plain or colored
Cranberry relish
Cucumber - slices or curls
Hard cooked eggs, sliced, deviled, riced
Fresh berries or fresh fruit
Gelatin squares
Grapes rolled in seasoned, powdered gelatin
Green or red pepper, rings or strips
Jellies
Lemon slices or wedges
Nuts, whole, chopped or slivered; can be toasted
Olives, plain, stuffed, green or ripe
Orange curls or slices
Onion rings or Scallions
Pineapple fans or fingers
Pickled fruit - pears, peaches, prunes, appricots, watermelon
Pickles - sweet, sour, dill, burr gerkins, fans, rounds
Pomegranate seeds
Radishes, plain, roses, or slices
Strawberries, whole with or without stem, sliced or dipped in sugar
Stuffed prunes, apricots, dates or plums
Sugared fresh grapes
Tomato, sliced and wedges
Watercress, mint, parsley

SUGGESTED SALAD COMBINATIONS

FRUIT SALADS

Apple, celery, orange, grapes and/or pineapple
Apple, celery, nuts, raisins and/or dates
Apricot, pineapple, orange sections, coconut
Banana, apple, orange
Banana, pineapple, green pepper
Cherries (Royan Ann), celery, cream cheese and nut ball
Cantaloupe ring filled with mixed fruits
Cantaloupe balls, red cherries
Figs stuffed with cream cheese, orange sections
Grapefruit, cherries and/or raspberries
Grapefruit, orange, pineapple, cherries
Orange, grapefruit, strawberries
Orange, plum sections
Peach, dates and/or raisins, nuts
Peach (pickled), cream cheese, ripe olives
Pear slices, banana, red raspberries
Pear, cream cheese, dates
Pear, stuffed with prunes, nuts
Pear, cranberry jelly center
Pineapple, black cherry and/or Tokay grapes
Pineapple, dates, marshmallows
Pineapple, celery, apple
Pineapple, grated American cheese, green pepper
Prune stuffed with peanut butter or cheese, orange and/or grapefruit sections

VEGETABLE SALADS

Asparagus, chopped celery, pimento
Asparagus, hard cooked egg sections
Asparagus, tomato wedges
Beet, cucumber slices
Carrot, cabbage, green pepper, cucumber cubes
Carrot, celery and/or raisins
Carrot, celery, olives
Cabbage, celery, eggs, peas

Cabbage, apple, dates
Cabbage, pineapple, marshmallow
Cabbage, Roquefort cheese, green pepper
Celery stuffed with cheese, chopped peppers, and/or pimento
Chinese cabbage, tomato wedges
Cole slaw--cabbage, onion, celery seed
Cucumber slices, onion, pimento
Cucumber boat filled with chopped vegetables
Cucumber cubes, sliced radishes
Endive, pimento, green pepper
Endive, orange, grapefruit sections
Green beans (cooked), finely chopped onion, cooked crisp bacon cubes
Green beans (cooked), finely chopped lima beans (cooked), celery, pickle
Lettuce wedge
Spinach, egg slices, radish garnish
Spinach, red cabbage, onion
Tomato, cauliflower buds, ripe olives
Tomato stuffed with celery, pineapple cubes

GELATIN SALADS

Cherry gelatin - sweet red frozen cherries
Lemon gelatin - cabbage, celery, green pepper, onion
Lemon gelatin - celery, olives, pimento
Lemon gelatin - chopped figs and/or dates, celery, nuts
Lemon gelatin - pineapple, sweet pickle, pimento
Lime gelatin - pineapple, cucumber
Orange gelatin - celery, Royal Ann cherries, olives
Strawberry gelatin - grapefruit, orange, pears

FISH SALADS

Shrimp, chopped celery
Tuna, chopped celery
Fresh steamed fish, chopped celery.

MEAT SALADS

Pork, chopped celery
Smoked ham, chopped celery
Tongue, chopped celery
Heart, chopped celery

NOTE: For variety, add one or more of the following: chopped pickle, olives, pimento, green pepper, onion or chives, cabbage or lettuce, eggs, peas, capers.

POULTRY SALADS

Chicken, chopped celery
Turkey, chopped celery
Game birds, chopped celery

NOTE: For variety, add one or more of the following: bean sprouts, green pepper, eggs, peas, onion or chives, pineapple, toasted, blanched almonds, green grapes.

CHEESE SALADS

Diced cheese, hard cooked eggs, peas, celery
Celery, prunes, or dates stuffed with cream cheese or grated cheddar cheese and nuts
Jellied cottage cheese, prunes and nuts in lemon gelatin
Cheese, macaroni, hard cooked eggs, celery, pickles and pimento
Tomato stuffed with cottage cheese and chives
Diced or shredded cheese in tossed salad

SUGGESTED COLD PLATES

Chicken salad, sliced tomatoes, cucumber fingers, toasted muffins, or buttered apricot, banana or nut bread sandwiches.

Jellied Waldorf salad, slices of oranges on endive, salted nuts, toasted cheese sandwich.

Hot potato salad, cold cuts, hard cooked egg, olive or pickle, rye bread and butter sandwiches.

Lobster salad, potato chips, pickle garnish, chive finger sandwiches or cheese strips

Cold steamed salmon, potato salad, tomato wedges, lettuce, whole wheat bread sandwiches.

Fruit salad, cottage cheese, lemon sherbet, nut bread finger sandwiches.

Tomato stuffed with cottage cheese, green pepper and onion, shoe string potatoes, pumpernickel sandwiches.

Deviled egg salad, relishes (celery, green pepper, radishes, green onions) Boston brown bread and cream cheese sandwiches.

NOTE: For variety, various meats, fish, etc., may be used in place of those mentioned. Other breads and sandwiches may be substituted. Other fresh foods in season may be used.

GUIDE OF AMOUNTS FOR PURCHASING SALADS

Meat and Meat Substitutes

Cheese, cottage	1 lb equals 2 cups
Cheese, shredded	1 lb equals 1 qt
Eggs, hard cooked, chopped	1 doz. equals 3½ cups, av.
Fish, canned, flaked	1 lb equals 1 pt.
Fish, fresh, cooked, flaked	1 lb equals 1 pt.
Meat, cooked, E.P. diced	1 lb equals 3 cups, av.
Poultry	
Chicken, cooked, E.P. (boned clear meat)	1 lb dressed wt yields 1 qt or 1 ob (The % yield depends upon amt of fat, size and type of bird.)

Turkey, cooked, E.P. (boned clear meat)	20 lb dressed wt yields from 9 to 10 lb or 9 to 10 qt (av yield per lb dressed wt = ½ lb or 50% yield. The % yield varies with amt of fat, size and type of bird.)

Fruits

Apples, fresh, whole	1 lb equals 3 av
Apples, fresh, diced	1 lb equals 3 cups, av
Bananas, fresh, whole	1 lb equals 3 av
Dates, pitted	1 lb equals 50 med., av
Dates, chopped	1 lb equals 2 cups, av
Grapes, Tokay, seeded, halved	1 lb equals 2½ cups, av
Oranges, fresh, whole	1 med equals 9-12 sections
Oranges, fresh, diced	1 doz equals 1 qt av
Peaches, canned, halves, #10	1 can equals 18-45 halves (32 halves, av)
Peaches, canned, halves, #2½	1 can equals 6-12 halves, (8 halves, av)
Pears, canned, halves, #10	1 can equals 36-65 halves (50 halves, av)
Pears, canned, halves, #2½	1 can equals 10-18 halves (14 halves, av)
Pineapple, fresh, diced	1 whole equals 3½ cups, av
Pineapple, canned, slices, #10	1 can equals 30-60 slices (45-50 slices, av)
Pineapple, canned, slices, #2½	1 can equals 8-12 slices (10 slices, av) (No. slices depends upon thickness)
Prunes, dried, medium	1 lb equals 30-40 av
Strawberries, fresh, hulled	1 qt equals 3 cups

Vegetables

Cabbage, fresh, E.P., shredded	1 lb equals 2 qt
Carrots, fresh, shredded	1 lb equals 1 qt
Celery, fresh, E.P., diced	1 lb equals 3½ cups
Lettuce, head, leaves	1 hd equals 10-12 leaves

Lettuce, leaf, shredded	1 lb equals 2 qt
Lettuce, leaf, garnishes	1 lb equals 30 garnishes
Pepper, green, whole	1 lb equals 5-6 peppers
Peppers, green, chopped	1 lb equals 3 cups
Tomatoes, fresh, whole	1 lb equals 3-4 tomatoes, av. size

NOTE: The above amounts are approximate yields. The amounts will vary with the size, cut, brand, pack, and various other factors.

LESSON 16 : PROGRESS TEST FOR LESSONS 13, 14 AND 15

A. GOAL OF THIS LESSON

The goal of this lesson is to review the most important aspects of the past three lessons, by administering the following Progress Test.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. summarize and review the important information presented in Lessons 13, 14 and 15;
2. emphasize the most important points presented in Lessons 13, 14 and 15;
3. identify subject areas in which participants desire or need further study and practice.

NOTE: The Progress Test should NOT scare or humiliate participants or be used as a device to keep them from continuing on with further lessons. There is no minimum score of success. This is an exercise or learning activity just as the other lessons have been.

C. INSTRUCTOR PREPARATION FOR CLASS PROGRESS TEST

1. The time allowed for this lesson is approximately 25 minutes.
2. Duplicate sufficient copies of Progress Test.
3. How the Progress Test should be given:
    - A. Pass out copies of the Progress Test to each participant.
    - B. Provide pens or pencils for those who may not have brought their own.

LESSON 16 : PROGRESS TEST FOR LESSONS 13, 14 AND 15

C. Explain that the reason for this Progress Test is to review the important information presented in the past three lessons.

D. Briefly go through the test together to explain the different kinds of questions to be sure that all participants know what they need to do for each question.

E. Allow approximately 25 minutes for participants to complete the test.

F. Allow participants to keep their own tests while answers are discussed.

G. State aloud which answer(s) is/are correct for each question.

H. Discuss how to change false statements so they read "true."

I. Lead a class discussion relating to reasons why other choices, if given, are incorrect. Ask participants to give examples of the application of each question to their school foodservice situation.

J. Allow any participants who so desire to retake the test on their own time.

K. Provide additional references on any topic to participants who desire further information.

LESSON 16 - PROGRESS TEST

True or False

In the space to the left of the number, write "True" if the statement is true, and write "False" if the statement is false.

_____ 1. Sauces and gravies are usually flavored stocks or liquids that provide moisture and flavor to foods.

_____ 2. Flour and cornstarch are two thickening agents for gravies.

_____ 3. Four basic sauces are brown, veloute, bechamel, and tomato.

_____ 4. A pan gravy has arrowroot as a thickening agent.

_____ 5. Soups should be served hot (170°F).

_____ 6. Chili is a variety of soup that can be served as the main protein source.

_____ 7. Canned chicken noodle soup meats the protein and one-half the bread requirement for school lunch.

_____ 8. Home-made soup takes too much time and is too expensive to prepare.

_____ 9. Chlorophyll is the green coloring matter of plants.

_____ 10. Canned vegetables only need to be heated.

_____ 11. Vegetables are leaves, seeds, roots, fruit, bulbs, or stems of plants.

_____ 12. Intense heat, acid and minerals in the water can turn green vegetables brownish.

_____ 13. Carrots or any yellow-orange vegetable will turn brownish when the sugar carmelizes from long standing.

_____ 14. Adding baking soda will ensure the bright green color in vegetables and retain vitamins and minerals.

_____ 15. Frozen vegetables can be cooked in the frozen state.

_____ 16. Vegetables should be cooked in one batch to ensure having enough.

_____ 17. Use seasoning with care to enhance the flavor of vegetables.

_____ 18. Taste vegetables before serving and be sure the vegetables are drained well.

_____ 19. Vegetables served in deep counter pans lose their eye appeal.

_____ 20. It is better to undercook than overcook vegetables.

Completion

Fill in the blank spaces to complete the sentence. The answers for completion are listed before the sentences.

21. base
22. body
23. dressing
24. garnish
25. lemon juice
26. pineapple juice or grapefruit juice
27. cabbage
28. canned
29. dirt
30. insects or sprays

1. Four parts of a salad are ________________, __________,
21 22

____________________, ____________________.
23 24

2. To prevent fruit from turning dark, add ascorbic acid,

____________________, __________________ or lemon
25 26

pudding mix.

PROGRESS TEST, Page 3

3. Bananas and ______________ float when added to
27
gelatin salads while ______________ tend to
28
sink.

4. Wash vegetables to be served raw with care to be sure

______________ and ______________ are
29 30
removed.

ANSWER SHEET

LESSON 16, PROGRESS TEST

1. *True*
2. *True*
3. *True*
4. *False*
5. *True*
6. *True*
7. *False*
8. *False*
9. *True*
10. *True*
11. *True*
12. *True*
13. *True*
14. *False*
15. *True*
16. *False*
17. *True*
18. *True*
19. *True*
20. *True*

LESSON 17 : BAKERY INGREDIENTS

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the role and importance of the main ingredients used in all bakery products.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. describe the differences among the various types of flours used in bakeshops, including refined and bleached;
2. describe the role of shortenings in baked goods, the types of shortenings available and when each is used;
3. name the various sugars used in bakeshops and when each is used;
4. name the kinds of leavening agents used in baked goods and how each is handled to give optimum results.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Make a transparency of Handout #17-1 and locate an overhead projector for use in the classroom.
2. Make sufficient copies of all handout materials.
3. Locate a chalk board for use in the classroom.

D. KEY WORDS USED IN THIS LESSON

ENRICHED: an enriched product has had vitamins and minerals added to it to replace and supplement those which were destroyed or reduced during processing. Some nutrients are added to the approximate levels that existed prior to processing. Enriched flour has various B vitamins and iron added.

LESSON 17 : BAKERY INGREDIENTS

FORTIFIED: a fortified product has had vitamins and minerals added to raise the nutrient levels above those normally found in the product. Lowfat milk is fortified with Vitamins A and D in Michigan.

GLUTEN: plant proteins found in flour that become tough through kneading of dough. Gluten gives structure and shape to baked products through kneading of dough.

EMULSION: a liquid mixture in which small fat globules are suspended individually, such as in a salad dressing or in whole homogenized milk. Emulsifiers added to shortenings help them disperse more evenly throughout a dough or batter. Monoglycerides and diglycerides are emulsifiers frequently added to shortenings.

LEAVENING: (or leavening agents) incorporation or formation of a gassing product that expands during preparation and heating. Three major leavening agents are air, water vapor or steam, and carbon dioxide.

PATENTS: grades used in the refining process to designate various flours during milling. Grades vary from 100% straight flour, long patent, medium patent, short patent, first patent, extra short or fancy patent to the most refined grades of fancy flour. Whole wheat flour would be 100% straight flour while cake flour would be the most refined, fancy flour.

ROLLED-IN DOUGH: a dough such as Danish which has a fat spread between layers of the dough to add flakiness and tenderness to a product. Techniques for "rolling-in" fat are given in most Danish pastry recipes.

E. REFERENCES FOR ADDITIONAL INFORMATION

Bennion, Marion. *Introductory Foods*. MacMillan Publishing Co., New York, New York, 1980.

Kotschevar, Lendal H. *Standards, Principles and Techniques in Quantity Food Production*. (see Lesson 18)

Woman's Day Encyclopedia of Cookery, Volumes 5 and 11. Fawcett Printing Corporation, Rockville, Maryland, 1966.

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT	CLASS ACTIVITY
I. BAKING REQUIRES MORE TECHNICAL KNOWLEDGE AND SKILL THAN ANY OTHER QUANTITY FOOD PREPARATION.	
A. Most Bakery Products Are Made of Similar Ingredients. A Slight Variation In:	
1. preparation method can result in an entirely different end product.	
2. proportion of ingredients can result in an entirely different end product.	
B. Success of Failure In Baking May Be Knowing the Slight Differences In Ingredient Properties.	
II. FLOUR IS A GROUND STARCH-LIKE PRODUCT USED TO GIVE STRUCTURE AND BODY TO BAKERY PRODUCTS.	
A. Flours May Be Made From Many Raw Products. Some Are: barley, buckwheat, corn, cottonseed, lima beans, peanuts, potatoes, rye, rice, and soybeans.	

LESSON CONTENT	CLASS ACTIVITY
B. Most Flours Commonly Used in Baking Are Made From Ground Wheat.	
1. Different kinds of wheat flour are needed to satisfy different needs in the bakeshop.	
2. Flour milling is a major American industry regulated by government specifications.	
3. Kinds of wheat or grains used to produce certain flours, and the way the flours are processed, enriched and packaged are regulated.	
4. Refining: a. is the process of separating the inner layer of the wheat kernel called the endosperm, from the two other portions, called the bran (outer layer) and germ.	Make a transparency from Handout #17-1 which shows the 3 main parts of the wheat kernel that are separated during the refining process. Identify the 3 major parts for participants.

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT

CLASS ACTIVITY

b. the endosperm makes up about 83% of the kernel, the bran about 14% and the germ.

c. if the refining process is complete, and the separation leaves only the heart of the endosperm, the resulting flour is called "short patent," which is like cake flour.

d. whole-wheat flour is unrefined, 100% straight flour because no separation of the three elements of the wheat kernel has occurred.

5. Bleaching:

   a. When flour is first milled, it has a slightly yellow color and does not bake as well as older, matured flour.

   b. Natural aging will bleach and mature the flour without the use of chemicals, but this requires several weeks.

LESSON CONTENT	CLASS ACTIVITY

c. Chemicals are often used to bring about these changes quickly, but such flour must be labeled "Bleached."

6. There are a variety of wheat flours available on the market, each with different properties that work best in certain products:

   a. Whole-wheat, graham or wheat flour are the same terms for flour made from any cleaned, unrefined, unbleached ground wheat.

   b. Gluten flour is a high-protein whole-wheat flour from which the starch or gluten has been removed.

   c. White, plain, all-purpose or general-purpose flour are synonymous terms for refined wheat flour which:

      1. may be bleached or unbleached.

      2. may be used in any recipe calling simply for "flour."

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT	CLASS ACTIVITY
d. Cake flour is a highly refined bleached flour so uniformly and finely ground that it feels soft and satiny.	
e. Pastry flour is refined bleached flour, but to a lesser degree than cake flour. 1. It has more gluten content and provides more strength and structure for baked products than cake flour, but less than all-purpose flour. 2. All-purpose flour may be substituted for cake or pastry flour if necessary. 3. For each pound of cake flour required, use 2½ oz of cornstarch and 14 oz of all-purpose or bread flour.	Locate a recipe that calls for cake flour. Arrange for participants to make the recipe in two versions: 1. Make as directed. 2. Make using the appropriate substitution of all-purpose flour and cornstarch as noted in the lesson. Compare the two end products and note any differences identified.

LESSON CONTENT	CLASS ACTIVITY
f. Enriched flour is refined bleached flour to which vitamins and minerals have been added as prescribed by the Federal government. Michigan does not require enriching flours. 7. Many other flour mixtures are available on the market, but they usually contain wheat flour in combination with another grain or cereal product, such as bran flour, cracked wheat flour, buckwheat flour, and oat flour. 8. Storage: a. Flour should be stored in a well-ventilated, dry place at about 70°F. b. In warm weather, keep the amount of flour stored "on-hand" low to eliminate possible problems with bugs or other pests infesting flour supplies and to avoid rancidity, especially in whole wheat flour.	

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT

CLASS ACTIVITY

c. If storerooms are too hot in the summer, store flour in refrigerator.

III. SHORTENINGS ARE FATS USED IN BAKING. THEY MAY BE SOLID SUCH AS LARD, BUTTER OR MARGARINE, OR HYDROGENATED VEGETABLE OILS.

A. Liquid Vegetable Oils or Drippings May Be Used in Baking When Specified By Recipe.

B. Few Shortenings For Baking Were Available In the Past. Butter, Lard and Chicken Fat Were the Main Shortenings Available.

C. Today, Almost Any Shortening Can Be Manufactured To Serve Any Purpose. The Processes Are:

1. hydrogenating: a process which makes vegetable oils solid; also makes solid fats more plastic and raises the melting point.
2. winterizing: a process that prevents oils from solidifying when refrigerated.

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT	CLASS ACTIVITY
3. emulsifying: adding monoglycerides or diglycerides to fats to help them spread throughout a batter or dough, producing a finer grained end product. a. Emulsifiers increase the shortening's power b. increase volume c. give a smoother and finer texture d. help retard moisture loss in finished baked products, thus increasing freshness e. emulsified shortenings cost more and should not be used for general cooking or deep frying because they will smoke at a lower temperature 4. Bleaching, deodorizing, decoloring and deflavoring may also be done to oils or shortenings for various reasons.	

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT	CLASS ACTIVITY
D. Shortenings in Baked Products Are to Tenderize or "Shorten" Them 1. surrounding flour particles (gluten) and other ingredients, 2. lubricating them so that they cannot stick together. E. Shortenings Vary in Plasticity Depending On Their Use. 1. For a flaky pie crust or rolled-in dough, a waxy, plastic, firm fat is needed so that when the dough is rolled out, layers of fat remain between the dough, lard or hydrogenated vegetable oils. 2. For icings, a flavorless, plastic fat that creams and aerates well, has no greasiness, and carries a high amount of sugar is necessary. 3. For some cakes, plasticity and waxiness in the fat are needed so that air is incorporated into the batter, thus increasing volume and creating a lighter cake.	

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT	CLASS ACTIVITY

IV. SUGARS ARE USED IN BAKING TO GIVE SWEETNESS, TENDERNESS, COLOR, CALORIES, GOOD CRUMB TEXTURE, CRUST COLOR, AND TO FURNISH FOOD FOR YEAST TO GROW.

A. Sugars Come In a Variety of Types.

1. Granulated Sugar is the product for general use. Sugars labeled "fine granulated" and "extra fine granulated" are also marketed.

2. Superfine or powdered sugar is a very fine granulated sugar which is used in recipes which need a quick-dissolving sugar.

3. Confectioners' sugar is granulated sugar that is crushed very fine and mixed with cornstarch to prevent caking.

   a. Fineness is indicated by a marking of "X"s such as 10X for ultrafine and 4X for very fine.

   b. 1 $^3/4$ cups confectioners' sugar equals 1 cup granulated sugar.

LESSON CONTENT	CLASS ACTIVITY
4. Brown sugar is extremely fine crystals that are covered with a film or coating of molasses. a. This coating gives the sugar its characteristic color and taste. b. At one time, 15 grades of brown sugar were produced, ranging in color from white to yellow to brown. Common grades are now light brown and dark brown. c. To avoid hardening, keep brown sugar in airtight containers in the refrigerator. d. To restore hardened sugar: (1) Heat in oven at low temperature until soft enough to crumble. (2) Sift it, roll it with rolling pin, or crumble it in a blender.	

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT	CLASS ACTIVITY
(3) Place a piece of apple, lettuce or fresh bread in brown sugar container.	
e. When measuring, pack brown sugar firmly into measuring containers; it should retain the shape of the container when removed.	
B. Use Sugar Specified in the Recipe.	
V. LEAVENING IS THE AERATION OF A PRODUCT DURING FERMENTATION, MIXING OR BAKING TO DEVELOP SHAPE, VOLUME AND TEXTURE.	
A. The Type and Quantity of Leavening Required Varies With:	
1. the product being made	
2. the amount and method of creaming, mixing or beating	
3. the type and quality of ingredients	

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT	CLASS ACTIVITY

4. the sequence of ingredient addition

5. the altitude

6. the technique and skill of the baker

B. To Leaven Properly, Leavening Gases Must Be Retained Until the Structure Is Set By Heat.

C. While Only a Small Quantity of Leavening May Be Used in Proportion to Other Ingredients, Its Influence on Quality Is So Great that Exact Measurement Is Necessary.

D. Air, Steam, Chemicals or Yeast Are Used As Leavening Agents. These Usually Work in Combination of Two or More Rather Than as a Single Leavening Agent.

1. Air

   a. creaming fats, eggs and sugar incorporates air which can leaven a baked item

LESSON CONTENT	CLASS ACTIVITY
b. the air in egg foams leavens products such as angel and sponge cakes and meringues	
c. air can be incorporated in other ways, such as sifting flour, beating a batter or manipulating dough	
d. once air is incorporated, care must be taken to see that it is retained by avoiding rigorous stirring and baking promptly	
e. air expands about a third in volume baking	
2. Steam	
a. When water changes to steam, it increases in volume 1600 times.	
b. Popovers, cream puffs and pie crust depend almost solely upon steam for their leavening.	

LESSON CONTENT	CLASS ACTIVITY

3. Chemical Leavening Agents

   a. Soda or sodium bicarbonate produces carbon dioxide gas that leavens food. Moisture is needed for this reaction, and heat speeds up the reaction, as does an acid ingredient.

   b. Baking powder which is bicarbonate of soda blended with an acid reactor is the most widely used leavening agent.

      (1) Single acting baking powders evolve their gas immediately when moistened and the complete reaction can occur while the product is still cold. Products must be baked immediately in a preheated oven.

      (2) Double-acting baking powders evolve from a fifth to a third of their gas in the cold stage, but heat is required to produce the remainder. These are the most common types used in quantity baking.

LESSON 17 : BAKERY INGREDIENTS

LESSON CONTENT	CLASS ACTIVITY

4. Yeast

   a. Is a single-celled plant which grows by feeding upon carbohydrates (sugars).

   b. Compressed or active dry yeasts are the most commonly used yeasts in quantity food preparation.

   c. A pound of active yeast equals 2½ lbs of compressed yeast in fermenting action.

   d. Grows best between 78°F and 90°F

   e. Growth of yeast is slowed above 98°F and is destroyed above 140°F.

   f. Moisture must be present for good yeast growth.

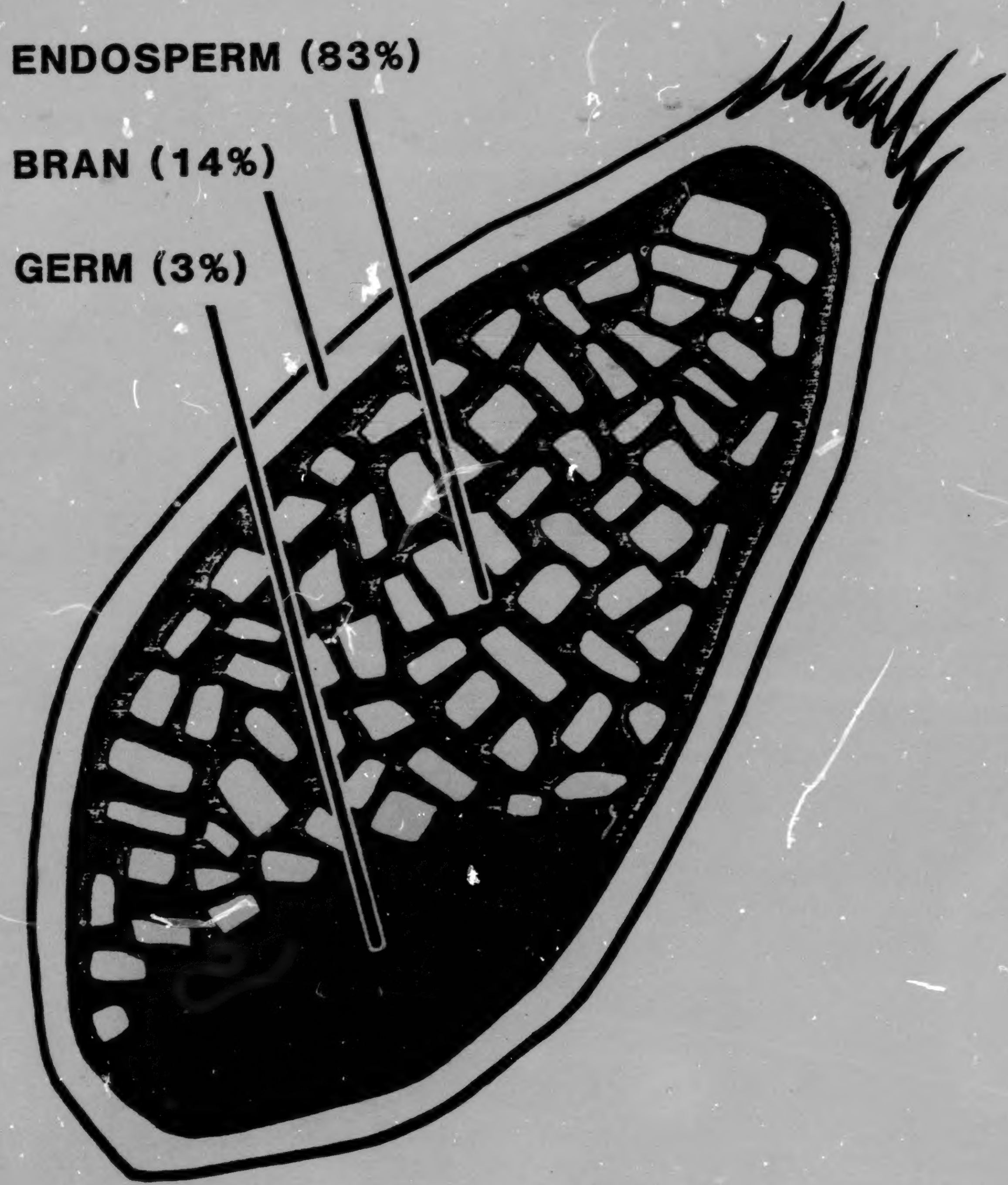
   g. Salt retards yeast growth.

   h. The amount of yeast used in warm weather is less than that used in cold weather. In air conditioning, use more yeast.

LESSON CONTENT	CLASS ACTIVITY
i. Compressed yeast should be kept in storage at 45°F while dry yeast may be held at cool room temperatures.	
VI. EGGS ARE USED IN BAKING TO GIVE TENDERNESS, STRUCTURE, NUTRITIONAL VALUE, FLAVOR, COLOR, AND MOISTURE.	
A. They Aid in Binding of Ingredients, in Leavening, in Emulsifying Fats, and Making a Firm Structure for the Product.	
B. Eggs May Be Counted As Part of the Liquid in a Recipe. (Whole eggs are 73% water.)	
VII. SALT IS USED IN BAKING TO ADD FLAVOR AND TO CONTROL THE RATE OF FERMENTATION IN MAKING YEAST PRODUCTS.	
A. Salt Controls the Rate of Carbon Dioxide Production by Yeast to Produce a Fine Grained Product.	
B. Omitting Salt in a Yeast Bread Will Result in a Finished Product with Large Irregular Air Pockets.	
C. Salt Masks the Off Flavors of Baking Powder and Baking Soda Residues.	

Handout #17-1

A KERNAL of WHEAT - ENLARGED 35 TIMES


ENDOSPERM (83%)
BRAN (14%)
GERM (3%)

499

LESSON 18 : YEAST BREADS

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic techniques for preparing yeast doughs and breads.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. identify the basic categories of yeast doughs;
2. list the three types of doughs used in yeast baking;
3. identify and explain the details of the straight dough method for making yeast dough;
4. describe the proper procedures for cooling and storing yeast breads.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.
2. Locate a chalk board for use in the classroom and several 12-inch rulers.
3. Arrange for use of a quantity kitchen for participants to use and arrange for purchase of ingredients needed to prepare sample recipes (See Handouts #18-2 and #18-3). If a kitchen is not available, arrange for sample products to be prepared or purchased as suggested on Handout #18-1.
4. If possible, arrange for an experienced baker to work with participants during the preparation portion of this lesson. Such a person would be very helpful in answering technical questions from participants and in evaluating products prepared. Contact this person several weeks in advance of the scheduled lesson. Alert this guest baker about:

a. the target audience and background of participants, including education and work experience if known;

b. the number of participants expected;

c. the goal(s) and purpose(s) of the lesson and topics to be covered in class prior to the preparation exercise.

5. Recontact the guest baker one week before class to confirm the date, time and location of the lesson.

6. Write a note to this person thanking him/her for his/her participation after completing the lesson.

D. KEY WORDS USED IN THIS LESSON

BENCH:	to put on the counter and allow to rest
BLOOM:	another term for color or browning of a product
CARMELIZATION:	the heating of sugar or foods containing sugar until a brown color and a characteristic flavor develop
DOCKING:	to pierce dough to eliminate air pockets for a more uniform bake
MAKE-UP:	the shaping of dough for baking
OLD DOUGH:	dough that has been over-fermented
OVEN SPRING:	a condition where a baking dough springs back when gently touched during the end of the baking process
PROOFING:	the development of yeast plants within the dough and protecting the moist elastic surface of the bread in a warm environment
RETARD:	to refrigerate or to lower in temperature
SCALE:	to weigh, measure or portion

SHRED: the crack that may occur on the top of a loaf of bread

SLACK DOUGH: dough that is soft or loose and has more liquid in proportion to flour; may mean dough that contains exhausted yeast and thus will not rise properly

STREAKED CRUMB: an uneven appearance on outer sides of a product, usually due to an unevenness in procedures such as greasing or flouring; uneven inner appearance may be due to improper mixing

STRONG FLOURS: flours such as bread and all-purpose flour

WEAK FLOURS: flours such as cake and pastry flours

YOUNG DOUGH: dough that has not been fermented enough

E. REFERENCES FOR ADDITIONAL INFORMATION

Kotschevar, Lendal H. Standards, Principles and Techniques in Quantity Food Production. Cahners Books, CBI Publishing Co., Inc., Boston, MA , 1974.

F. SUGGESTED SOURCES FOR RESOURCE PERSONS

To locate a baker to use as a resource person for this lesson, contact:

1. schools in your district or neighboring districts that are doing on-site baking;
2. local bakeries operating in the community;
3. instructors in area commercial foods programs in high schools;
4. instructors in area junior colleges that have a commercial foods major.

LESSON 12 : YEAST BREADS

LESSON CONTENT | CLASS ACTIVITY

I. **YEAST DOUGHS**

A. Bread or Straight Doughs Contain Flour, Sugar, Shortening, Yeast, Dry Milk, Liquid, and Salt

1. Hot dog buns, hamburger buns and dinner rolls are baked with this dough.

2. Bread is baked with this dough.

B. Rich or Sweet Doughs Have the Same Ingredients, Plus Eggs, Spices and Flavorings

1. Breakfast rolls are frequently made with sweeter dough.

2. Has limited use in school lunches.

II. **PRODUCTION PROCEDURES**

A. Three Methods for Preparing Dough:

1. straight dough

2. sponge doughs

3. no-time doughs

LESSON 18 : YEAST BREADS

LESSON CONTENT	CLASS ACTIVITY
B. Most Operations Use the Straight Dough Method in the Following Steps:	
1. Weighing and mixing:	
a. use standardized recipes and weigh ingredients accurately	
b. assemble all ingredients and equipment before mixing	
c. use vertical floor mixers for yeast dough mixing. Use the dough hook attachment	
2. Fermenting:	
a. the dough ripens	
b. observe proper times and temperatures; too rapid a fermentation or too high a temperature develops an acid or a sour dough	
c. if fermentation is occurring at room temperature and the humidity is low, cover the dough and/or brush the top with oil or shortening to avoid crust formation	

LESSON CONTENT	CLASS ACTIVITY
d. fermentation varies with dough because of the composition of the flour and environmental conditions	
e. end fermentation when the dough is: (1) about double in volume (2) when pressure on top of dough will cause an indentation and spring back	
f. there is about a 2% loss in dough weight during fermentation	
3. Punching and resting:	
a. punching a dough is not knocking or pushing it down	
b. to punch, fold a dough over from its sides into the middle until most of the gas is expelled	
c. flip the dough upside down in its fermenting bowl or container	

LESSON 18 : YEAST BREADS

LESSON CONTENT	CLASS ACTIVITY
d. good punching remixes ingredients to give the yeast new food, and relaxes the gluten e. some straight doughs are fermented again after punching f. after the punch, return the dough to the work bench and rest it about 10 to 15 minutes to relax and become pliable for makeup and shaping. The rest time for sweet or rich doughs may be less. 4. Make-up a. the process in which items are shaped for baking b. weight loss during baking is about 12%; for every pound of finished bread, scale 18 ounces c. rounding, a part of the make-up process, shapes the divided dough into smooth, round shapes	

LESSON 18 : YEAST BREADS

LESSON CONTENT

CLASS ACTIVITY

(1) The dough should be soft and elastic and, as it is rounded and gas escapes, it may "squeak like a mouse"

(2) The rounded surface should be smooth when done. A rough surface allows gas to escape in proofing.

d. specific techniques are required to roll in shortening as is done in Danish. The details of this skill should be learned from one of the references listed for this lesson

e. after rounding, give an intermediate proof of 8 to 12 minutes to allow the item to recover from the effects of make-up. If this rest is not given the dough is tight and shapes up poorly in the pan

f. doughs may be retarded (refrigerated) or frozen at this point, if desired

LESSON CONTENT	CLASS ACTIVITY
(1) Doughs should be retarded at a temperature of 40°F and a relative humidity of 85% or more which will hold them well for 72 hours (2) Retarded or frozen doughs should be covered well in storage. 5. Proofing a. proofing gives dough its final conditioning b. the gluten in the flour becomes quite tender and extended, and the outer surface smooth and light in appearance c. during proofing the products more or less double in volume from make-up size d. temperatures should be between 90°F and 100°F with a relative humidity of 80 to 85%	

LESSON 18 : YEAST BREADS

LESSON CONTENT	CLASS ACTIVITY

- e. time varies from 15 to 45 minutes with 30 to 45 minutes being usual for bread loaves
- f. over-proofing gives an open grain, a gray color to the crumb and a loss of flavor

6. Baking
    - a. firms the product, thus preserving texture and shape
    - b. oven load very carefully; some proofed doughs are fragile
    - c. during the early part of baking, the rise of the dough is quite rapid
        - (1) carbon dioxide gas expands
        - (2) yeast activity proceeds at a very rapid rate until the dough reaches 140°F at which time the yeast is destroyed

LESSON CONTENT	CLASS ACTIVITY
(3) This rapid rise is called oven spring d. when the oven heat completely swells the starch and coagulates the protein, the structure becomes firm e. a shred or break on the side of the loaf may occur because the rise continues on the interior after the exterior is set by heat (1) small products such as rolls bake uniformly and do not show this shred (2) docking (slits or cuts on the top) must be used for some products to allow for this final expansion and prevent bursting or shredding f. color or bloom is now developed on the outside of the baked product through a carmelization of sugars in the dough	

LESSON CONTENT	CLASS ACTIVITY
g. use correct temperatures: (1) low baking temperatures develop a pale, rubbery crust with poor oven spring and poor texture (2) excessive heat develops an over-brown crust h. steam in the oven cavity is used to retard crust formation and develop thick, crisp crusts, as on French breads. Modern bake ovens have automatic steam jets mounted in each oven cavity i. a well-baked bread loaf gives a hollow sound when tapped 7. Cooling a. bump loaves and rolls from their pans onto cooling racks to allow steam to escape	

LESSON 18 : YEAST BREADS

LESSON CONTENT	CLASS ACTIVITY
b. avoid drafts or too cool air which cause breads to crack	
c. brush breads with shortening to prevent the crust from becoming dry in cooling	
d. rolls served soon after baking should be completely baked, but rolls that are cooled and then reheated may be slightly underbaked	
8. Storing	
a. after cooling, wrap or place bread in moisture-vapor-proof bags for storage over 8 to 10 hours long; otherwise, store on racks	If baking facilities are not available for participants, distribute Handout #18-1, and briefly review the title heading under the "Fault" column. Provide a variety of bread samples that exemplify some of the faults listed in this handout. Ask participants to identify the possible causes of the faults they identify in each sample.
b. store crisp breads such as French bread in open boxes or paper bags	
c. the staling of bread is a deterioration characterized by a loss of aroma, an increase in firmness and crumbliness, and the development of a more coarse crumb texture	

LESSON 18 : YEAST BREADS

LESSON CONTENT

d. breads stale more rapidly under refrigeration than they do at room temperature. Refrigeration of bread should only occur if molding is a problem in warmer weather.

e. freezing holds breads best when extended storage is required

Materials for this lesson were adapted from Standards, Principles and Techniques in Quantity Food Production by Lendal Kotschevar

CLASS ACTIVITY

Note to Instructor:
Sample loaves can be made in advance using the guidelines given at the end of Handout #18-1.

If cooking facilities are available for participants, divide them into pairs and give each couple one of the recipes provided in Handouts #18-2 or #18-3. Compare baked products and evaluate them using the evaluation form provided on Handout #18-4.

Handout #18-1

TROUBLE-SHOOTING BREAD FAILURES

FAULT	Possible Causes	Possible Remedies
Excessive volume	Too much yeast	Reduce yeast to 2 to 3%; check weighing procedures.
	Excess dough	Reduce scaling weights
	Too cool oven	Increase temperature
Poor volume	Weak flour	Blend strong flour into flour or use a stronger flour; give less mixing, shorter fermentation, and less proofing time.
	Lack of leavening	Use good yeast and handle it properly; have dough a proper temperature; reduce quantity of salt.
	Undermixing	Increase mixing times until gluten in dough is properly developed; proper volume of dough to mixer is also a factor to check.
	Overfermented dough	Reduce fermentation time
	Overmixing	Reduce mixing

FAULT	Possible Causes	Possible Remedies
	Improper proofing	Proof between 90°F and 100°F and 80 to 85% relative humidity; watch proofing time and maintain proper ratio between fermentation and proofing procedures.
	Too hot oven	Reduce temperature
Too dark crust	Overmixing	Reduce mixing
	Too hot oven	Correct oven temperature
	Too long baking	Reduce baking time
	Too dry oven	Close oven damper during part of baking, or use steam.
	Overfermentation	Reduce temperature or time of fermentation
	Excessive dusting flour	Too much flour used on rolling surface
	Cool oven	Increase temperature
	Improper use of steam	Avoid excessive steam; open dampers to increase oven moisture

FAULT	Possible Causes	Possible Remedies
Spotted crust	Improper mixing	Follow correct mixing procedures and sequences in adding ingredients.
	Excess humidity in proofing	Reduce relative humidity to between 80 and 85%.
Hard crust or blisters	Slack dough	Reduce liquid; check mixing
	Improper mixing	Check mixing procedures and sequences in adding ingredients
	Old or young dough	Correct the fermentation
	Cool oven or too much top heat	Check damper handling procedures and oven temperatures; check heating elements and heat source to see if functioning properly; check oven circulation
	Too much fat on product	Reduce brushing of fat after make-up
Poor shape	Improper make-up or panning	Correct procedures
	Overproofing	Reduce

FAULT	Possible Causes	Possible Remedies
Flat top or sharp corners	Low salt	Increase; check weighing procedures
	Slack dough	Reduce liquid; check mixing
	Young dough	Increase fermentation time
	Excessive humidity in proofing	Reduce humidity
Excessive break on side	Overmixing	Reduce mixing
	Improper molding	Check molding, especially seam folds; place seam folds down on bottom of pan
	Hot oven	Reduce temperatures
Thick crust	Mixing improper	Correct mixing procedures
	Improper proofing	Correct temperature, relative humidity, or time of proofing; check for wet crusts after proofing
	Old dough	Correct fermentation and/or proofing time

FAULT	Possible Causes	Possible Remedies
	Improper baking	Correct temperatures and times; reduce steam and check for excessive or insufficient moisture in ovens.
	Old dough	Correct fermentation and/or proofing time
	Improper baking	Correct temperatures and times; reduce steam and check for excessive or insufficient moisture in ovens
Tough crust	Old or young dough	Check fermentation times
	Improper mixing	Correct
	Excess proof or wrong or poor conditions	Correct
	Oven cold or excess steam	Correct
Ragged scaling or shelling on top	Old or young dough	Check fermentation or proof times and conditions.
	Stiff dough	Reduce flour or increase liquid

FAULT	Possible Causes	Possible Remedies
	Crusting during proofing	Increase relative humidity; brush lightly with shortening
	Excess salt	Reduce
	Underproofing	Increase proofing time.
	Excessive top heat in oven	Check heat circulation and heat source in oven; check damper control.
	Cold dough	Add warmer liquid; check mixing, fermentation and proofing temperatures
	Excessive dough in pan	Check scaling
	Lack of salt or milk	Check recipe and weighing procedures
Too close grain	Low yeast	Increase; check weighing procedures
	Underproofing	Increase proofing time
	Excess dough in pan	Check scaling procedures

FAULT	Possible Causes	Possible Remedies
Too coarse or open grain	Old dough	Excess yeast; reduce fermentation time.
	Slack dough	Reduce liquid; check mixing time.
	Improper molding	Correct.
	Overproofing	Reduce time or check temperatures.
	Improper pan size	Check.
	Cold oven	Increase oven temperature.
	Excessive greasing	Check oiling or greasing of dough.
Gray crumb	High diastatic action	Reduce.
	High dough temperature or over-fermentation	Check mixing, fermentation, and proof temperatures and times.
	Cold oven	Check temperatures and conditions of baking.
Streaked crumb	Improper mixing	Check ingredient sequence of adding in mixing.
	Too slack or stiff dough	Check liquid or flour quantities; check to see if proper mixing times are given.

FAULT	Possible Causes	Possible Remedies
	Excessive oil or grease or dusting flour used	Correct.
	High relative humidity	Reduce relative humidity in fermentation or proofing.
	Crusting of dough in fermentation	Increase relative humidity or brush with fat; cover to prevent moisture loss.
Poor texture	Alkaline or very hard water	Use conditioner or vinegar.
	Too slack or too stiff dough	Reduce or increase ingredients to correct ratios; check mixing.
	High sugar or excess yeast	Check ingredient ratios; check diastase, and decrease or increase as required.
	Lack of shortening	Increase.
	High dough temperature	Reduce liquid temperature or temperatures during fermentation or proofing.
	Overfermentation or proofing	Reduce fermentation time.

FAULT	Possible Causes	Possible Remedies
	Excessive dusting of flour	Reduce amount of flour put on table where dough is rolled.
	Improper mixing or method	Check procedures.
Flat flavor	Low salt	Increase salt.

Adapted from: Standards, Principles and Techniques in Quantity Food Production, by Lendal Kotschevar

PREPARATION OF WHITE BREAD BY THE STRAIGHT DOUGH METHOD

Handout #18-2

INGREDIENTS	TOTAL 23 lbs 15/1½ lb loaves	TOTAL 11½ lbs 7½/1½ lb loaves	Procedure
Yeast, compressed	6 oz	3 oz	Dissolve yeast thoroughly in part of warm water in large container.
Warm Water (100°F)	8 lbs	4 lbs	Add shortening and rest of warm water and mix together.
Soft Shortening	6 oz	3 oz	
Malt	2 oz	1 oz	Mix dry ingredients thoroughly in mixer bowl. Add liquid mixture from above. Mix to smooth, well developed dough using 2nd speed on 4 speed mixer for 15 minutes.
Salt	4 oz	2 oz	
Sugar	8 oz	4 oz	
Dry Milk Solids	6 oz	3 oz	
Bread Flour	13 lbs	7 lbs 8 oz	
			Check dough temperature. Should be 80-81°F for best results. Allow to ferment for 2 hours till doubled in size. Punch down and bench 30 minutes. Scale 1½ lbs per loaf, round and allow to relax 20 minutes. Mold loaves and place in greased bread pans. Split top with knife if desired. Proof till doubled in size. Bake in 350°F oven till brown and sounds hollow when tapped. Remove from pans to cool.

Cost per portion: ______________

Total cost: ______________________

9/24/81

Handout #18-3

PREPARATION OF BASIC SWEET DOUGH BY THE STRAIGHT DOUGH METHOD

INGREDIENTS	TOTAL 30 lbs	TOTAL 15 lbs	Procedure
Yeast, compressed	1 lb	8 oz	Dissolve yeast thoroughly in part of warm water in large container.
Warm water (100°F)	7 lb 8 oz	3 lb 12 oz	Add shortening and rest of warm water; mix together.
Soft shortening	2 lb 8 oz	1 lb 4 oz	
Bread flour	15 lb	7 lb 8 oz	Mix dry ingredients thoroughly in mixer bowl. Add liquid mixture from above. Mix approximately 6 minutes on medium speed. Care should be taken not to overmix. Check dough temperature when mixed. Should be 80°F for best results.
Dry Milk Solids	12 oz	6 oz	
Sugar	2 lb 8 oz	1 lb 4 oz	
Salt	3 oz	1½ oz	
Mace	½ oz	¼ oz	
Whole Eggs	1 lb	8 oz	
Grated Rind and Juice	2 lemons	1 lemon	
		Allow to ferment for 1 hour til doubled in size. Punch down and bench for 30 minutes. Scale into 2 oz portions and shape into Parker House, single (bowknot), double or kaiser knot rolls as directed. Place on greased sheet. Proof for 15 to 30 minutes until rolls are doubled in size. Bake at 350°F until golden brown. Cool before removing from pans.	

Cost Per Portion: ____________________

Total Cost: _________________________ 9/24/81

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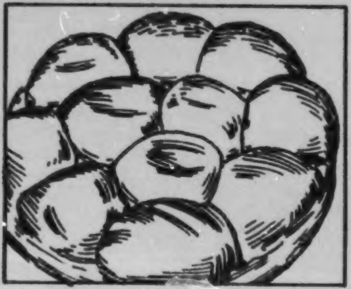

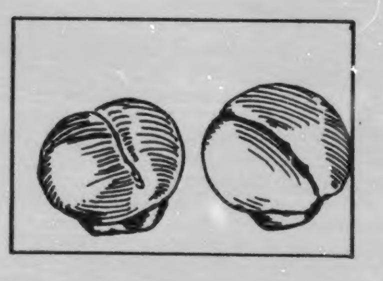

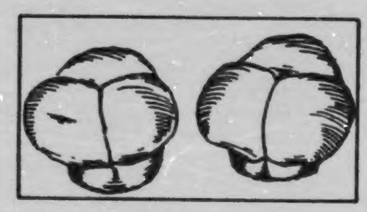

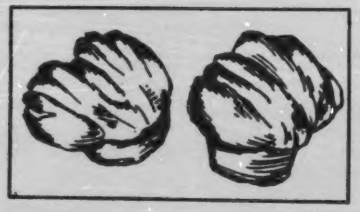

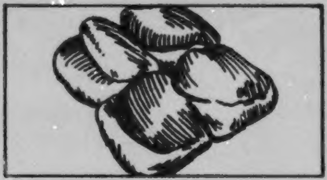

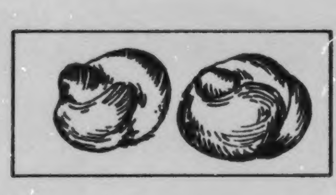

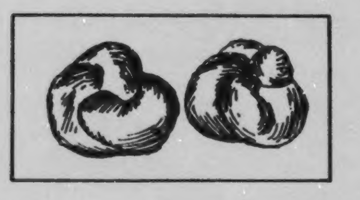

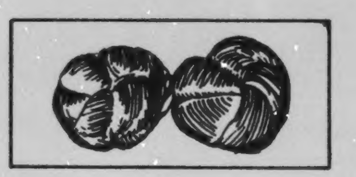

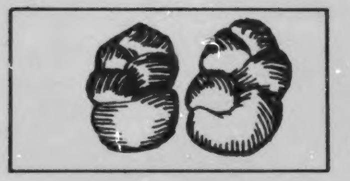

Handout #18-4

EVALUATION CRITERIA FOR JUDGING YEAST BREADS

As a class, review these criteria together before judging any samples. Judge products on a scale from 1 to 10 (10 = most desirable).

CRITERIA	DESCRIPTION OF CRITERIA	SAMPLE 1	SAMPLE 2	SAMPLE 3
1. Volume	Measure loaf height and length. Multiply loaf height X length X width to determine cubic inches. Pound of dough = 125-155 cu. in. so 1½ lb loaf should contain approximately 185-230 cu. in.			
2. Crust color	Even, rich golden brown bloom; no spotting or unevenness			
3. Symmetry of Form	Even shape, good proportion, absence of deformities			
4. Evenness of Bake	Uniformly browned sides, ends and bottoms with no excessive browning.			
5. Crust Character	Tender, moderately thick and uniform. (Hard-crusted bread may have thick, crisp crusts.)			
6. Break or Shred	Condition of the areas between the top and side where at last minute rise inside the bread creates a break that is open and evenly shredded.			

Handout #18-4/Page 2

CRITERIA	DESCRIPTION OF CRITERIA	SAMPLE 1	SAMPLE 2	SAMPLE 3
7. Grain	Internal appearance. Even-sized and evenly spaced cells should be present.			
8. Color	A slice of bread or cut roll held at a 45° angle toward the floor in good light should have a creamy white interior with a soft sheen. A gray or uneven color is undesirable.			
9. Texture	Rub tips of fingers or the side of the cheek against the cut surface of the product; roll a bit into a ball between fingers to test for texture. Velvetiness, softness, moistness and elasticity are desirable. Harshness or graininess detracts from quality. Overly soft, doughy, crumbly or lumpy bread with hard texture is undesirable. Bread after cooling, when squeezed, should spring back to nearly its original shape.			
10. Flavor	Judged by aroma and taste; the odor should be fresh and sweet with no trace of sourness or off-odor. Flavor should be sweet, wheaty and not too salty.			

LESSON 19 : QUICK BREADS

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic techniques for preparing quick breads and doughs.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. identify the basic types of quick breads commonly prepared;
2. describe a well-baked muffin, biscuit, griddlecake, waffle, eclair, and popover;
3. demonstrate knowledge of quick break baking procedures following given recipes;
4. evaluate samples of various quickbreads following specified criteria.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.
2. Locate chalk board for use in the classroom.
3. Arrange for use of a quantity kitchen for participants to use and arrange for purchase of ingredients needed to prepare sample recipes (see Handouts #19-2 through #19-5). If a kitchen is not available, arrange for sample products to be prepared or purchased as suggested on page 3 of Handout #19-1.

LESSON 19 : QUICK BREADS

4. If possible, arrange for an experienced baker to work with participants during the preparation portion of this lesson. Such a person would be very helpful in answering technical questions from participants and in evaluating products prepared. Contact this person several weeks in advance of the scheduled lesson. Alert this guest baker to:
    a. the target audience and background of participants including education and work experience, if known;
    b. the number of participants expected;
    c. the goal(s) and purpose(s) of the lesson and topics to be covered in class prior to the preparation exercise.
5. Recontact this guest baker one week before class to confirm the date, time and location of the lesson.
6. Write a note to this person thanking him/her for his/her participation after completing the lesson.

D. **KEY WORDS USED IN THIS LESSON**

RICH BATTER OR DOUGH: contains a high proportion of shortening or fat

LEAN BATTER OR DOUGH: contains a low proportion of shortening or fat

SLACK DOUGH: is soft or loose and has more liquid in proportion to flour

CUT (TO CUT): to cut shortening into a flour mixture means to divide or cut up the shortening into small particles, each surrounded by flour; when done correctly, final mixture contains particles of an even, small size.

LESSON 19 : QUICK BREADS

BENCH KNIFE: square-shaped cutting tool about 6 inches long, used to cut doughs

EMULSION: a preparation consisting of minute particles of shortening, fat or oil, held in suspension in a liquid; in a good emulsion, no separation occurs

CONDITIONED PANS: baking pans which are conditioned or seasoned are those which have had oil or grease rubbed on them but are not washed with any type of detergent after use. Such pans are cleaned by using a clean, absorbent cloth. Baked-on foods may be removed by rubbing the area with regular salt and again wiping the pan clean with an absorbent cloth. Such treatment provides pans that allow baked products to be removed easily without sticking or breaking.

PITTING: a term used to describe the unevenness of color in griddlecakes.

E. REFERENCES FOR ADDITIONAL INFORMATION

Jernigan and Ross. Food Service Equipment, Iowa State University Press, Ames, Iowa 50010, 197 . ($6.65)

Kotschevar, Lendal H. Standards, Principles and Techniques in Quantity Food Production. Boston, MA: Cahners Books, CBI Publishing Co., Inc., 1974.

West, B., Shugart, G., and Wilson, M. F. Food for Fifty, 6th Edition. New York: John Wiley and Sons, Inc., 1979. (Out of print)

LESSON 19 : QUICK BREADS

F. SUGGESTED SOURCES FOR RESOURCE PERSONS

To locate a baker to use as a resource person for this lesson, contact:

1. schools in your district or neighboring districts that are doing on-site baking;
2. local bakeries operating in your community;
3. instructors in area commercial foods programs in high schools;
4. instructors in area junior colleges that have a commercial foods major.

LESSON 19 : QUICK BREADS

LESSON CONTENT	CLASS ACTIVITY

I. QUICK BREADS DO NOT CONTAIN YEAST

- A. They Are Easier and Quicker To Make Than Yeast Breads.
- B. Types Include: Banana and Other Fruit Breads, Pancakes, Popovers, Muffins, and Scones.
- C. The Basic Ingredients Are Liquid, Leavening Agent, Fat, Eggs, Sugar, and Flour.
- D. Variation in Product Is Achieved By:
  1. the proportion of ingredients used;
  2. mixing method;
  3. baking method;
  4. type of flour or other cereal product used.

II. QUICK BREADS ARE CLASSIFIED TWO WAYS

- A. The Type of Leavening Agent Used.

LESSON 19 : QUICK BREADS

LESSON CONTENT	CLASS ACTIVITY

1. Products leavened by baking powder or baking soda would include biscuits, griddle cakes, scones and shortcakes.

2. Products leavened by steam would include popovers, eclairs, and Yorkshire puddings.

B. The Thickness of Batter

1. Products made from drop batters would include cornbread, loaves, spoon breads and dumplings, and some muffins.

2. Products made from pour batters would include popovers and waffles.

3. Products made from soft doughs would include scones, coffeecakes, tea breads, doughnuts, and biscuits.

C. These Products Are Very Different But Are Made With Almost the Same Ingredients.

1. They differ in the proportions used;

LESSON 19 : QUICK BREADS

LESSON CONTENT

CLASS ACTIVITY

2. In the way they are mixed;

3. The way they are baked or cooked.

D. Variety Comes From the Cereal Products Used, Including Wheat, Whole-Wheat, Rye, Corn Flours, Bran, Oatmeal or Cornmeal.

E. Quick Breads May Be Made From Mixes.

1. The mixes made on-site should be stored in air-tight containers, marked and stored.

    a. Master mixture contains essential ingredients with the exception of the liquid to be added at the time of preparation.

    b. Mixes should be stored in the refrigerator if to be held more than 2 or 3 weeks to obtain the best results.

2. Commercial mixes once opened should be stored in tightly sealed containers.

LESSON CONTENT	CLASS ACTIVITY
III. QUALITY STANDARDS AND PREPARATION METHODS VARY. A. Muffins Are a Quick Bread. 1. Quality Standards: a. large in size compared to weight b. crisp, shiny, pebbly, golden brown crust c. well-rounded top, free from knobs d. moist, light, tender interior crumb with no tunnels 2. Preparation guidelines for muffins include: a. lightly grease muffin pans b. dust with flour over the greased area to reduce sticking c. thoroughly clean pans with a clean, soft absorbent cloth; do not wash	

LESSON CONTENT	CLASS ACTIVITY
d. sift dry ingredients into mixer bowl e. mix blended eggs, liquids and liquid shortenings, and pour liquids into the middle of the dry ingredients f. mix ingredients with mixer paddle at slow speed for 15 to 20 seconds g. a final batter should be rough and lumpy, breaking easily when gently spooned into tins 3. Portion with a #16 scoop. Take the batter from the inside edge out, eliminating stirring and reducing toughness in the end product after baking. 4. If the batter is too deep in the muffin pans or if the muffins are baked at too high a temperature, tunneling is possible. 5. If the batter is too deep in the muffin pans, or if the muffins are baked at too high a temperature, or of the batter is mixed til smooth, tunneling may occur.	

LESSON 19 : QUICK BREADS

LESSON CONTENT	CLASS ACTIVITY
6. Pan and bake muffins immediately after mixing. If this is not possible, place in refrigerator until baking time.	
7. After baking, avoid a soggy or overmoist product. Remove the muffins from the pans or set them on their sides in the muffin cups to allow steam to escape and the product to dry out.	
8. Heavy muffins may be the result of: a. overmixing b. mixing too slowly c. too much flour or liquid d. insufficient leavening e. low oven temperature	
9. Heavy crusts on muffins may be the result of:	

LESSON CONTENT	CLASS ACTIVITY
a. over-greased pans b. baking too long c. too hot an oven temperature B. Baking Powder Biscuits Are Rolled or Dropped. 1. Quality standards for rolled biscuits include: a. straight, even sides with a level top b. good volume (double in height from unbaked to baked) c. tender crust, not crumbly d. smooth, golden brown color e. inside texture fine, even-grained and fluffy f. inside color creamy-white, free from yellow or brown spots	

LESSON CONTENT	CLASS ACTIVITY
g. break away easily when pulled apart with moist, soft crumbs that pull away in thin flakes or layers 2. Dropped biscuits will vary somewhat from these standards. They will be: a. shorter; b. less perfect in shape; c. have crust qualities similar to those of a muffin. 3. Preparation guidelines for rolled biscuits include: a. mix all dry ingredients together in mixing bowl b. cut shortening into dry ingredients using pastry blender or mixer paddle at low speed until product looks like loose, coarse cornmeal	

LESSON 19 : QUICK BREADS

LESSON CONTENT	CLASS ACTIVITY
(1) overmixing gives a fine-bready texture (2) undermixing develops a coarse texture c. add the combined liquids to dry ingredients using the paddle at low speed until a soft dough is formed. Overmixing at this stage toughens biscuits. d. knead dough on lightly floured bench and fold lightly: (1) use the finger tips to lift the dough up, then press the dough down with the heel of the hand (2) use a light touch and pressure (3) give the dough a half-turn after each kneading, about 20 in all, requiring about 30 seconds total time.	

LESSON 19 : QUICK BREADS

LESSON CONTENT	CLASS ACTIVITY
e. at the end of kneading, the dough should be soft and springy but not sticky f. if kneading is omitted, a shorter, crisper, lower-volume biscuit is obtained g. cut for baking biscuits by rolling the dough half the final height desired and cutting evenly and straight down; twisting may give a poor shape (1) roll out dough evenly and uniformly to give even biscuit size and baking (2) cut biscuits from the rolled dough in squares or triangles with a knife so that all the dough is used in one cutting. Avoid reworking the cutting scraps because they give tough, compact biscuits.	

h. set the biscuits apart on baking sheets to give a more highly colored, crisper biscuit

i. wash the tops of cut biscuits with a milk, evaporated milk or egg wash before baking to color them

j. bake all biscuits at 400°F for 15 to 20 minutes.

4. A dropped biscuit is not kneaded. Follow the preparation guidelines above.

   a. The dough is slightly more moist and leaner (less shortening) than regular biscuit dough.

   b. Biscuit dough is dropped onto greased baking sheets from a spoon or scoop.

   c. The resultant product has less volume, a rougher appearance after baking, a crisper crust and a more tender crumb than a regular cut biscuit.

LESSON 19 : QUICK BREADS

LESSON CONTENT	CLASS ACTIVITY
5. Shortcakes are merely rich biscuit doughs containing extra sugar and shortening.	
6. Dumplings are variations of biscuit dough and may contain eggs.	
7. Poor biscuit quality may result from one or more of the following conditions: a. heavy or compact crumb caused from: (1) overmixing or overkneading dough (2) insufficient baking powder or shortening (3) too much liquid or flour (4) oven too cool b. pale crust caused from: (1) oven too cool (2) baked in too deep a pan (3) too much flour	

LESSON CONTENT	CLASS ACTIVITY
c. poor volume caused by: (1) oven too cool (2) insufficient baking powder d. light but not flaky; may be caused by: (1) shortening cut in too finely into flour (2) insufficient kneading e. poor shape caused by: (1) too slack dough (too much liquid) (2) uneven rolling of dough (3) twisting the cutter during cutting (4) careless cutting or panning	

LESSON 19 : QUICK BREADS

LESSON CONTENT

CLASS ACTIVITY

C. Griddlecakes (Pancakes or Hotcakes) Are Served In the Breakfast Program and Sometimes For Lunch

1. Quality standards for griddlecakes include:
    - a. a clear, even brown color
    - b. good round shape
    - c. no pitting (dry crust pitted by gas holes) on the top or bottom
    - d. moist texture, slightly heavy
    - e. well-cooled inside
    - f. tender with firm, slightly crisp exterior
    - g. flavor that is pleasing and only slightly bready

LESSON 19 : QUICK BREADS

LESSON CONTENT	CLASS ACTIVITY
2. Preparation guidelines for griddlecakes include: a. sifting dry ingredients together well b. blending liquids into dry ingredients c. griddlecakes have thinner batter d. overmixing can toughen the waffles	
3. Griddlecakes are baked on lightly greased griddle at about 350°F to 375°F. a. About 2 oz of batter are used for a small cake and 4 oz for a large one. b. As the heat strikes the batter, volume increases and bubbles rise to the top of the cake on the grill. c. When the edge shows a slight drying, the cake should be turned. d. Complete baking in one turn since additional turning lowers quality of the griddlecake.	Prepare quick breads using Handouts #19-1 through #19-5.

LESSON 19 : QUICK BREADS

LESSON CONTENT	CLASS ACTIVITY
e. The cake will rise slightly in the center after being turned. When this recedes and the top becomes even, the cake is done. f. Even griddle heat is necessary for best quality. g. Too low a temperature gives a poor color and texture. h. Too high a temperature gives a dark color and the cake may be undercooked in the center. i. A pitted top after baking indicates too high a heat or too long a time lapse before turning.	

Handout #19-1

COMMON QUALITY STANDARDS FOR QUICK BREADS--EVALUATION FORM

	Yes	No	Comments
1. Muffins			
large in size compared to weight			
crisp, shiny, pebbly, golden brown crust			
well-rounded top, free from knobs			
moist, light, tender crumb with no tunneling			
2. Baking Powder Biscuits (Rolled)			
straight, even sides with level top			
good volume			
tender crust, not crumbly			
smooth, golden-brown color			
fine texture, even-grained, fluffy			
inside color creamy-white, free from spots			
breaks away easily when pulled apart			
moist, soft crumbs that flake or layer			
3. Griddlecakes			
even brown color			
good round shape			
no pitting on top or bottom			

Handout #19-1/Page 2

	Yes	No	Comments
3. Griddlecakes			
moist texture			
well-cooked inside			
tender with firm, slightly crisp exterior			
pleasing flavor, slightly bready			
4. Waffles			
light, even, brown color			
even shape without ragged edge			
tender crusts			
interior open with tender crumb			
flavor slightly sweet, nutty, pleasant			
5. Eclair or Popovers			
round, irregular top			
delicate tan			
large for its weight			
good height			
large, hollow interior			
shiny bottom with no holes			
crisp, brittle, tender crusts			
slightly moist interior, not pasty			

Handout #19-2

CLASS ACTIVITY WHEN KITCHEN FACILITY FOR PARTICIPANTS IS NOT AVAILABLE

GUIDELINES FOR INSTRUCTOR IN PREPARING SAMPLE QUICK BREADS

Arrange to have one batch of each of the recipes in this lesson prepared in advance of the class. The suggestions below for each product made will provide a variety of samples and conditions for participants to identify.

MUFFINS - 8 dozen batch

1. Scoop out muffin batter and bake as directed on the recipe.
2. Scoop out muffin batter and put into overly greased tins.
3. Scoop out muffin batter and bake for 25 minutes instead of 20 minutes.
4. Scoop out muffin batter and bake as directed but do not remove from tins after baking as recommended.
5. Scoop out muffins and bake at 350°F instead of 400°F.
6. Scoop out muffins and bake at 425°F instead of 400°F.
7. Let batter sit at least 45 minutes and then scoop 12 and bake as directed.
8. Overmix batter of last muffins and then scoop and bake as directed.

BISCUITS - 8 dozen batch

1. Divide dough into 8 approximately equal parts. Each of these parts will make about 12 biscuits. Below are 8 variations to use for each portion of dough.

2. Do not knead at all. Immediately roll out dough, cut and bake as directed on the recipe.

3. Knead as directed on recipe, cut and bake.

4. Knead as directed on recipe, cut and bake for 20 minutes instead of 15 minutes at regular temperature.

5. Knead as directed on recipe, cut and bake for only 8 minutes instead of 15 minutes at regular temperature.

6. Knead as directed on recipe, cut and dip in melted margarine and place 2 inches apart on ungreased baking sheet. Bake as directed on recipe.

7. Knead as directed on recipe, cut and place in 2 or 3 inch deep pan ½-inch apart and baked as directed on recipe.

8. While kneading, work more flour into the dough. Cut and place on baking sheet with sides of biscuits touching each other. Bake as directed on recipe.

9. Overknead dough (knead 30 times instead of 20 times), cut and bake as directed on recipe.

GRIDDLECAKES

1. Prepare half of base recipe.

2. Bake 3 cakes correctly as directed on the recipe.

3. Bake 3 cakes on 400°F griddle.

GRIDDLECAKES (continued)

4. Bake 3 cakes on a 300°F griddle.

5. Overmix remaining batter and bake 3 cakes as directed on recipe.

ECLAIRS

1. Make half of base recipe for eclair paste.

2. Portion 5 eclairs using #16 scoop; bake as directed on recipe.

3. Portion 5 eclairs using pastry tube (2 oz each); bake as directed on recipe.

4. Portion 5 eclairs using pastry tube and bake as directed on recipe but when removed from oven, place in a cool drafty place to cool.

5. Portion 5 eclairs (pastry tube) and bake at 350°F for 40 minutes.

6. Portion 5 eclairs (pastry tube) and bake at 400°F for 40 minutes.

7. Overcook remaining paste, portion 5 eclairs (pastry tube)and bake as directed on recipe.

Handout #19-3

PLAIN MUFFINS WITH VARIATIONS

#20 Scoop		Quick Breads 19-2
INGREDIENTS	AMOUNT/8 doz.	PROCEDURE
Cake flour Baking powder (double action) Sugar Salt Nonfat dry milk	4 lb 14 oz 5½ oz 12 oz 1 T + 1 t 9½ oz	Use mixer with paddle attachment. Mix on first speed 10 minutes.
Whole eggs Cold Water	12½ oz (8 lg eggs) 2 qt	Blend well with whip. Using first speed add to dry ingredients and mix SLIGHTLY
Hydrogenated fat TOTAL	1 lb 9 oz 12 lb 9 oz	Melt and cool measured amount of fat. Add and mix on first speed ONLY until ingredients are dampened. DO NOT ADD EXTRA FLOUR. DO NOT OVERMIX. Let batter stand 15 minutes before scooping into greased tins with #20 scoop. Bake 18 to 20 minutes at 400°F.

Variations of Muffins

To the recipe for 8 dozen, add 1 lb 8 oz chopped apples, apricots, cherries, dates, prunes, raisins, or whole blueberries; or 1 lb of chopped nuts. Remove 8 oz of blended dry ingredients from first step above to dredge fruit. Add this "floured fruit" to the batter last. Increase yield by 8 to 12 muffins.

Adapted from: Michigan State University Circular Bulletin 236.

Handout #19-4

ROLLED SHORTCAKE BISCUITS

2¼-INCH BISCUITS QUICK BREADS 19-4

INGREDIENTS	AMOUNT (8 doz)		PROCEDURE
Cake flour Baking powder (double action) Sugar Salt Nonfat dry milk	4 lb 9 oz 7¼ oz 5 $\frac{3}{4}$ oz 1¼ oz 6 oz		Use mixer with pastry blender or paddle attachment. Mix on first speed five minutes.
Butter or Margarine Hydrogenated fat	6 $\frac{3}{4}$ oz 1 lb 9 oz		HAVE FAT CHILLED. Break into ¼-pound chunks. Cut into dry mixture using first speed, until mixture is uniformly "pebbly."
Cold water	1¼ qt		Add on first speed and mix until dough barely sticks together. Shift to second speed and blend for ¼ minute. Dough will appear soft and sticky. DO NOT ADD EXTRA FLOUR. Let stand 15 minutes before handling. Knead 15 to 20 times on lightly floured board. Roll out to ½-inch thick. Cut with 2¼-inch cutter. Place ¼-inch apart on ungreased baking sheet. Bake for 12 to 15 minutes at 400°F.
TOTAL	10 lb 6 oz		

Adapted from: Michigan State University Circular Bulletin 236.

Handout #19-5

GRIDDLECAKES

#16 Scoop/Cake

QUICK BREADS 19-5

INGREDIENTS	AMOUNT (50 cakes)		PROCEDURE
Pastry flour Baking powder Salt Sugar Nonfat dry milk	4 lb 10 oz ½ oz 1 lb 4 oz 12 oz		Using whip attachment, combine and blend thoroughly all dry ingredients on first speed. (This dry mixture may be made in advance and stored in a tightly covered container for use as needed.)
Whole eggs	12 oz (8 lg eggs)		Use mixer with whip attachment. Using second speed whip eggs til light, about 5 to 6 minutes.
Water Salad oil or melted, cooled shortening	1½ qt 10 oz		Add and blend.
TOTAL	6 lb 14 oz		Add dry mixture to combined liquids using first speed and mix only enough to dampen. Batter should be slightly lumpy. Dip with level #16 scoop onto lightly greased hot griddle at 350°F. Turn when bubbles break and cake edges are dry and firm.

Adapted from: Michigan State University Circular Bulletin 236.

LESSON 20 : PIES AND PASTRY

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic techniques for preparing various types of pies and pastry.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. describe the purpose and role of each ingredient used in pie dough;
2. identify the conditions that encourage gluten development;
3. prepare and portion several types of pies correctly.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.
2. Locate a chalkboard for use in the classroom.
3. Optional: Arrange for use of a quantity kitchen for participants, and arrange for the purchase of ingredients needed to prepare sample recipes (See Handouts #20-1 through #A-4). If a kitchen is not available, arrange for sample pies to be prepared or purchased as suggested in the first class activity listed.
4. If possible, arrange for an experienced baker to work with participants during the preparation portion of this lesson. Such a person would be very helpful in answering technical questions from participants and in evaluating products prepared. Contact this person several weeks in advance of the scheduled lesson. Alert this person to:

a. the target audience and background of participants including education and work experience, if known;

b. the number of participants expected;

c. the goal(s) and purpose(s) of the lesson and topics to be covered in class prior to the preparation exercise.

5. Recontact this guest baker one week before the class.

D. **KEY WORDS USED IN THIS LESSON**

BOIL-OUT: the liquid fruit juices that may bubble out of a baking fruit pie because of improper sealing of the two crust layers, or because the pie is overfilled.

DOUBLE-PANNED BAKING: baking procedure whereby a second pie tin is placed inside or on top of an unbaked piecrust in order to decrease shrinkage of the dough and blistering during baking.

SCALING: to weigh, measure or portion.

PLASTICITY: a term used to describe shortening; refers to a shortening's capacity for being molded, and of being easily worked into the flour.

UPRIGHT MIXER: another term for a vertical mixer which is the traditional floor or table type mixer found in quantity preparation kitchens.

PASTRY BLENDER OR PASTRY KNIFE: attachment or type of beater used on an upright mixer; used to cut shortening into flour for pie dough.

LESSON 20 : PIES AND PASTRY

FLUTED: the decorative edge on a pie shell created by gently pinching the dough edge between the thumb and forefinger.

WAXY MAIZE STARCH: a corn-based modified type of starch used as a thickener; it is the same thickness when hot as when cold; reheats and freezes well; it is one of several waxy starches used in food preparation today.

E. REFERENCES FOR ADDITIONAL INFORMATION

Hardwick, Geraldine B., and Kennedy, Robert L. Fundamentals of Quantity Food Preparation--Desserts and Beverages. Boston, MA: Cahners Books, CBI Publishing, Inc., 1975.

Kotschevar, Lendal H. Standards, Principles and Techniques in Quantity Food Production. Boston, MA: Cahners Books, CBI Publishing, Inc., 1974.

Kotschevar, Lendal H. Understanding Food. New York: John Wiley and Sons, Inc., 1969.

Terrell, Margaret E. Large Quantity Recipes. New York: J. B. Lippincott Co., 1975.

F. SUGGESTED SOURCES FOR RESOURCE PERSONS

To locate a baker to use as a resource person for this lesson, contact:

1. schools in your district or neighboring districts that are doing on-site baking.
2. local bakeries operating in the community.
3. instructors in area commercial foods programs in high schools, or
4. instructors in area junior colleges that have a commercial foods major.

LESSON 20 : PIES AND PASTRY

LESSON CONTENT | CLASS ACTIVITY

I. PIES AND PASTRIES ARE POPULAR DESSERT ITEMS

A. They May Require Much Labor Unless:

1. wisely selected;
2. a convenient layout is set up for the work;
3. good production techniques are used.

B. To Achieve Satisfactory Costs, Production Standards Should be Established and Strictly Adhered To.

II. THERE ARE MANY KINDS OF PIES AND PASTRIES

A. Single or Double Crust

B. Filled With:

1. fruit
2. cream filling
3. egg custard

LESSON 20 : PIES AND PASTRY

LESSON CONTENT	CLASS ACTIVITY
4. gelatin	
5. other sweetened and thickened mixtures	
6. ice cream, mousse or other frozen desserts	
C. Tarts and Dumplings Are Pastry Variations and Included in this Group	
D. Crusts Vary	
1. puff paste	
2. graham cracker	
3. dark chocolate wafer	
4. vanilla wafer	
5. nut	
6. meringue	

LESSON 20 : PIES AND PASTRY

LESSON CONTENT	CLASS ACTIVITY

III. QUALITY STANDARDS FOR REGULAR PIE CRUST

A. Crisp, Tender and Breaks Easily

B. Flaky, Semi-flaky or Mealy, Depending on the Recipe

C. Golden Brown To Cream Surface; the Cream in the Center Darkening to a Golden Brown at the Edge.

IV. USE PRECISE SCALING, GOOD INGREDIENTS AND SKILLFUL TECHNIQUES IN MIXING AND SHAPING.

A. Skills in Mixing Ingredients:

1. Blend the shortening into the flour well to give a mealy crust; mixing to leave the fat in large pieces and give a flaky or a semi-flaky crust.

2. Use a piecrust blade on a vertical mixer for cutting the shortening into the flour, and a flat paddle to blend in the water. A flat paddle may be used for both operations.

LESSON 20 : PIES AND PASTRY

LESSON CONTENT

CLASS ACTIVITY

3. The amount and vigor of mixing is critical to crust quality after the water is added which gives moisture needed for gluten development.

4. Watch mixing times for pie doughs
   - a. Blending the flour and shortening on an upright takes from 15 to 90 seconds at slow speed.
   - b. About 40 seconds at slow speed are sufficient for mixing in the water.
     - (1) Add all water with the salt dissolved into it at one time, spreading it well over the blended shortening and flour.
     - (2) Mix it only until the water is blended and the dough JUST leaves the sides of the bowl.

5. Excess mix time favors gluten development, as does warmth, so doughs should be kept chilled.

LESSON 20 : PIES AND PASTRY

LESSON CONTENT

CLASS ACTIVITY

6. A 15-minute rest after mixing decreases baking shrinkage and makes the dough easier to roll.

7. Pie doughs can be stored about a week under refrigeration.

8. Pie dough mix may be left dry and kept stored for use as needed but such storage should not be for more than 10 days as rancidity can develop quickly in such a mixture of shortening and flour.

B. Assembly Instructions

1. Bottoms should contain about 6 oz of dough and tops about 5 oz of dough for a 9-inch pie. Crust thickness governs these amounts as does the size of the pie tin used.

2. Use as little dusting flour during rolling as possible since dough is toughened by the addition of too much dusting flour.

LESSON CONTENT

CLASS ACTIVITY

3. Keep the rolling pin and top of the dough only lightly dusted with flour. Rolling on a canvas requires less dusting with flour.

4. To begin rolling, take a measured amount of dough (6-8 oz)

    a. With quick, deft strokes, starting from the center, roll the dough into an oval shape, then turn it and make it into a circle.

    b. Lift and turn the dough as frequently as necessary, checking each time to see that dusting flour remains underneath.

5. Docking or making holes in the crust is needed for single crust pie shells to prevent blistering in baking.

6. Time is saved if the excess dough from the bottom and top crusts is removed at the same time on a 2-crust pie.

LESSON 20 : PIES AND PASTRY

LESSON CONTENT	CLASS ACTIVITY
7. Single crust pie shells are baked from 425°F to 450°F for about 15 minutes while double crust pies and filled pastries are baked at 425°F to 450°F for 10 minutes, dropping the temperature to 350°F or 375°F for the remaining 35 to 50 minutes needed to complete baking. Some bakers prefer a temperature of 350°F to 375°F for the full baking time for two-crust pies.	
V. FILLINGS SHOULD BE MADE WITH THE SAME CARE AS THE CRUST BECAUSE THE FILLING GIVES IDENTITY TO THE BAKED PIE.	
A. Pie Fillings Vary in Consistency and Type	Bring a commercially prepared and a "homemade" pie of the same variety to class for evaluation. Using the evaluation form on Handout #20-1, divide participants into pairs and have each couple evaluate the sample pie. Share results with entire class.
1. A starch-thickened filling is delicate, smooth and soft, sagging only slightly at the cut edge.	
2. A fruit filling should ooze slightly at the cut edge.	
B. Double Crust Pies Usually Have Fruit Fillings.	

LESSON 20 : PIES AND PASTRY

LESSON CONTENT	CLASS ACTIVITY
1. About 3 or 4 cups, or 1½ to 2 lbs of filling are needed for a 9-inch pie.	
a. The larger amount is usually adequate for a two-crust pie.	
b. The smaller amount is used in pies topped with whipped cream or meringue.	
2. The quality of the fruit filling is affected by the type of fruit, the thickening agent, the proportion of thickening agent, sweetening agents used and the method of preparation.	
a. The thickener can also be blended with some of the liquid or fruit juice and added as a slurry to the remaining hot liquid or fruit juice.	
b. Cooking of the filling should continue until thickening is complete which for cornstarch and flour occurs at 203°F, and for waxy maize and converted starches at 195°F.	

LESSON CONTENT | CLASS ACTIVITY

c. Frozen fruits should be drained and only the juice thickened and then blended with the fruits.

C. Fruit Pie Thickeners

1. Cornstarch and flour are commonly used as fruit pie thickeners.

2. The best thickener is a waxy maize starch because it gives clarity and brilliance to the fruit.

VI. TOPPINGS ON PIES VARY

A. Single Crust Pies Topped With:

1. whipped cream

2. whipped topping

3. meringue

4. toasted coconut

5. crumbs

6. nuts

LESSON 20 : PIES AND PASTRY

LESSON CONTENT	CLASS ACTIVITY
B. Fruit Pies Have Solid Top Crust or a Lattice Top. A Streusel-Like Topping Called "French" or "Dutch" May Also Be Baked On Top in Place of a Second Crust.	
VII. PROPER SERVICE OF PIES OFFERS A FRESHLY PREPARED APPEARANCE.	Pie and pastries are not frequently made from scratch in school food service operations. However, if your group makes pies and pastries, do the class food preparation in Appendix I.

Handout #20-1

PIE AND PASTRY EVALUATION FORM

CRITERIA FOR JUDGING	Sample 1		Sample 2		Sample 3		Sample 4	
	Yes	No	Yes	No	Yes	No	Yes	No
I. Regular Pie Crust A. Crisp, tender; should break easily								
B. Flaky or mealy, depending on recipe								
C. Cream colored in center darkening to golden brown at edges								
D. Appearance rough & blistery on surface; not smooth								
E. Easily cut; not crumbly								
F. Test for oiliness by rubbing piece between fingers								
II. Pie Fillings A. Starch-thickened cream filling: 1. Delicate, smooth, soft								
2. Not gummy or pasty								

Handout #20-1/Page 2

CRITERIA FOR JUDGING	Sample 1		Sample 2		Sample 3		Sample 4	
	Yes	No	Yes	No	Yes	No	Yes	No
II. Pie Fillings								
3. Sags slightly at cut edge								
4. Flavor sweet & pleasant; characteristic of product								
B. Fruit fillings								
1. Oozes slightly at cut edge								
2. Not gummy or pasty								
3. Each piece of fruit clear, distinct								
4. Clear, bright color								
5. Flavor sweet & pleasant; characteristic of product								
C. Custard Type Fillings								
1. Sharp edge at cut surface								
2. Firm with no flow								
3. Good sheen at cut surfaces								
4. Flavor sweet & mellow; not 'eggy'								

LESSON 21 : CAKES AND COOKIES

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic techniques for preparing various cakes and cookies.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. describe the basic types of cakes and their differences;
2. identify the main quality standards for each cake type;
3. identify the differences in the creaming and blending methods of cake mixing;
4. describe proper cake panning, baking, cooling and storage;
5. prepare a sample of each basic cake type as assigned;
6. describe procedures used in preparing foam and butter cream frosting;
7. identify differences and similarities in cake and cookie doughs, and preparation methods;
8. prepare a sample of several kinds of cookies as assigned.

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.
2. Locate a chalk board for use in the classroom.
3. Arrange for the use of a quantity kitchen for participants to use and arrange for purchase of ingredients needed to prepare sample recipes in Handout #21-3 through #21-10. If a kitchen is not available, arrange for sample products to be prepared or purchased. Samples of the 8 recipes included in this lesson would be preferred over commercially purchased products.

4. If possible, arrange for an experienced baker to work with participants during the preparation portion of this lesson. Such a person would be very helpful in answering technical questions from participants and in evaluating products prepared. Contact this person several weeks in advance of the scheduled lesson. Alert this guest baker to:
   a. the target audience and background of participants including education and work experience, if known;
   b. the number of participants expected;
   c. the goal(s) and purpose(s) of the lesson and topics to be covered in class prior to the preparation exercise.
5. Recontact this guest baker one week before class to confirm the date, time and location of the lesson.
6. After the lesson is over, write a thank you note to this person, thanking him/her for help in this class.

D. KEY WORDS USED IN THIS LESSON

HYDROGENATED SHORTENINGS: shortenings that have undergone the hydrogenation process, which makes liquid oils solid and solid fats more plastic and raises the fat's melting point.

REEL OVEN: a type of commercial oven where shelves or decks are mounted on a large wheel or reel which rotates around in the oven cavity to produce more even baking.

LESSON 21 : CAKES AND COOKIES

CONDITIONED OR SEASONED PANS: baking pans which have had oil or fat rubbed on their inside surfaces but are not washed with any type of detergent after use. Such pans are cleaned by rubbing the surface area with regular salt and wiping the pan clean with an absorbent cloth. Such treatment provides pans that allow baked products to be removed easily without sticking or breaking.

STARCH GELATINIZATION: a swelling of starch cells caused by moisture and heat that causes thickening. This thickening process starts and ends at different temperatures for each starch. For example, cornstarch begins gelatinization (swelling) at 150°F and ends around 203°F.

PROTEIN COAGULATION: a process in which protein becomes firmer from application of heat; it occurs at around 160°F and causes color change in many protein products, such as eggs.

TUNNELING: a condition found in poorly prepared baked products, caused by air bubbles trying to rise in a dough or batter with over-developed gluten.

REFERENCES FOR ADDITIONAL INFORMATION

Kotschevar, L. H. Standards, Principles and Techniques in Quantity Food Preparation. Cahners Books, CBI Publishing, 1974.

LESSON 21 : CAKES AND COOKIES

West, B. B., Shugart, G. S., and Wilson, M. F. Food for Fifty, 6th Edition. John Wiley and Sons, New York, 1979.

Jernigan, A., Judge, J., Spillman, M. Food Preparation, 3rd Edition. Iowa State University Press, Ames, Iowa, 1975.

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT	CLASS ACTIVITY

I. CAKES ARE A POPULAR DESSERT. A WIDE VARIETY OF CAKES CAN BE MADE BY VARYING SLIGHTLY A FEW BASIC CAKE BATTERS.

A. Variety Is Also Achieved By Using Different Shaped Pans, Different Fillings and Frostings.

B. Cake And Cookie Mixes Simplify the Preparation of These Products.

II. DEFICIENCIES IN MATERIALS, EQUIPMENT OR OPERATING CONDITIONS MAY PREVENT THE PRODUCTION OF HIGH QUALITY CAKES.

A. Quality Is Compromised By:

1. fluctuating oven heat;
2. poor temperature controls;
3. excessive vibration;
4. warped or sagging oven shelves;
5. uneven baking decks.

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT

CLASS ACTIVITY

a. Reel ovens should be equipped with stabilized shelves.

b. Severe vibration makes cakes separate in the center and have poor volume and crumb.

c. Uneven heat gives low volume, dark and thick crusts, tunnels, and an uneven surface, plus shrinkage and pulling away from the pan sides.

B. Even the Best Baker Cannot Overcome Equipment Problems.

III. CAKES ARE CLASSIFIED BY THE INGREDIENTS OF LEAVENING AGENT USED.

A. Butter Cakes

1. Are produced more frequently than others.

2. The word "butter" may be a misnomer today because hydrogenated shortenings and margarines are commonly used in such cakes.

3. Ingredients used in a butter cake are shortening, eggs, flour, sugar, salt, baking powder, liquid and flavoring.

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT	CLASS ACTIVITY
B. Pound Cakes 1. Pound cake batters are used for fruit cakes, nut cakes and steam puddings. 2. The ingredients of a true pound cake are equal weights of sugar, shortening, eggs and flour. Salt and flavorings are also added in small amounts. 3. Leavening in a pound cake is usually from air incorporated in creaming. Some modified pound cake recipes contain baking powder. C. Foam Cakes 1. Egg foam cakes are angel food, sponge and chiffon. 2. Air incorporated by egg foam is the major leavening agent. 3. Some chiffon and sponge cakes have baking powder to assist in leavening. 4. Chiffon cakes are shortened cakes as oil is an ingredient.	

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT	CLASS ACTIVITY

5. A sponge cake recipe may call for shortening but an angel food cake recipe will not.

6. Foam cakes are usually not prepared in batches of more than 100 portions because their delicate structure may be destroyed by a heavier batch weight.

IV. STANDARDS FOR HIGH QUALITY CAKES

A. Butter Cake Standards:

1. Even on all sides, slightly rounded on top.

2. Less rounding on large sheet cakes.

3. Shiny crust which is golden, tender, thin, crisp, smooth and not blistered.

4. Cut surface fine, even grain, soft, light, tender, velvety to the touch.

5. No dullness, cloudiness or streaks on cut surfaces.

6. Moist crumb that is tender.

7. Mild, sweet, rich, delicate, and buttery flavor.

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT

CLASS ACTIVITY

B. Pound Cake Standards:

1. Even shape, slightly rounded top.
2. Thin crust, soft, delicately browned and slightly split in the middle.
3. Rich, smooth crumb with no trace of oiliness.
4. Firm texture that is fine, with compact cells.
5. Sweet, delicate flavor, rich and substantial.

C. Angel Food Cake Standards:

1. Even, fine, light grain that is feathery and moist.
2. More delicate and tender than sponge or chiffon cakes.
3. The crumb not hard, brittle or excessively moist.
4. Cell walls clear, white reflecting a delicate sheen.

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT

5. Even sides and slightly rounded top.
6. Delicately browned crust, not moist or sticky.

D. Sponge or Chiffon Cake Standards

1. Delicate, springy, light texture.
2. Moist, soft crumb.
3. Delicate flavor.
4. Even grain, not coarse or excessively feathery or moist.
5. Fine cells with soft sheen.
6. High, even shape.
7. Crust lightly browned.

V. THERE ARE SEVERAL CAKE MIXING METHODS

A. The Conventional or Creaming Method and the Blending Method Are Most Commonly Used to Mix Butter Cakes.

CLASS ACTIVITY

Using the evaluation form on Handout #20-1, judge the quality of cake samples presented. Samples may be prepared in advance of the class or may be prepared in class by participants.

NOTE TO INSTRUCTOR: See suggestions and guidelines for this class activity on Handout #21-1.

LESSON CONTENT	CLASS ACTIVITY

B. The Conventional Sponge Method and the Muffin Method Are Used Less Often and Produce a Product of Slightly Lesser Quality.

C. Procedure for Mixing Butter Cakes:

1. use the mixing paddle attachment for the mixer;
2. check that final batter level is just above the mixing paddle;
3. have all ingredients, including eggs and shortening, at room temperature, about 75°F to 80°F.

D. Procedure for the Conventional or Creaming Method:

1. cream shortening to a waxy stage;
2. add sugar and continue to cream until a light color and a fluffy texture is obtained to assure maximum air incorporation.
3. scrape down bowl frequently from bottom and sides of bowl into mixer action in the center;

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT	CLASS ACTIVITY

4. add eggs in three equal parts, creaming well at medium speed after each addition;

5. add a fourth of the sifted dry ingredients and a third of the liquid;

6. usually there are 4 additions of dry ingredients and three additions of liquids;

7. fill pans and give several sharp raps to each to free air bubbles caught in the batter.

E. Overmixing After All Ingredients Are Added May Give:

1. excessive gluten development;

2. excessive leavening loss;

3. a heavy, compact cake with tunneling.

F. Undermixing Gives a Coarse, Poor Crumb.

G. Procedure for the Blending Method:

1. Mix flour and shortening together with mixer paddle for 3 to 5 minutes.

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT	CLASS ACTIVITY

2. scrape down bowl sides and bottom often;

3. mix sugar, salt, baking powder, and dry milk solids, and add with a third to a fourth of the liquid;

4. add liquid in two stages to give a smooth batter without lumps;

5. after mixing 3 to 5 minutes, add eggs, remaining liquid and flavoring; mix 3 to 5 minutes;

6. batter thinness is no indication of poor quality or low cake volume.

H. There Are Variations To the Creaming and Blending Mthods that Are Also Commonly Used. These Variations Plus the Conventional Sponge and Muffin Methods Are Discussed in the Reference book, Standards, Principles and Techniques in Quantity Food Production, by Lendal Kotschevar.

I. Cake Mixes Are Available Which Contain All Ingredients Needed Except Water and Perhaps Eggs.

1. They require little skill, equipment or inventory of material ingredients.

LESSON CONTENT	CLASS ACTIVITY

2. They provide many simple cake variations for dessert menus.

J. Details on Techniques for Making Pound, Angel, Sponge, and Chiffon Cakes Are in the Kotschevar Text.

VI. CAKE QUALITY IS AFFECTED BY PANNING

A. Procedure for Panning:

1. Fill pans with butter or pound cake batter half or two-thirds full, to allow for proper expansion. Overfilled pans spill over in baking with a loss of quality or even total collapse.

2. Use paper liners for pan bottoms since greased pan sides reduce cake volume.

3. Use conditioned or seasoned pans.

4. Handle pans with care; do not bang them around, drop them or handle them so that they lose shape.

LESSON CONTENT	CLASS ACTIVITY

5. Observe panning weights and scale the appropriate amount of batter into the pans. Handout #21-2 summarizes batter scaling weights for a variety of cakes and pan sizes.

B. Pans With Sloping Sides Give Less Volume Than Straight-Sided Ones.

C. Black Pans Give More Volume and Bake More Rapidly Because They Absorb More Heat.

VII. THE BAKING IS CRITICAL TO QUALITY

A. Leavening Increases Volume and the Gelatinization of Starch and Coagulation of Protein provides the Structural Framework.

B. Four Baking Stages:

1. Stage 1--a rapid rise of the fluid batter occurs.

2. Stage 2--rising continues, the center rising higher than the sides. Bubbles and a slight surface tan appear and some batter firmness is evident on the sides.

LESSON CONTENT	CLASS ACTIVITY

3. Stage 3--rising is completed. The structure sets, top browning increases and spreads over the surface. A slight aroma of baked cake is evident.

4. Stage 4--browning is completed. The sides of the cake are pulled slightly away from the pan and a full-baked aroma indicates that the cake is done. It is firm to the touch, springing back (called oven-spring) and leaving no imprint. A toothpick or wire tester, if inserted, comes out clean, indicating done-ness.

C. Temperature Is Critical in Baking Cakes.

1. Small cakes and thin cakes are baked at higher temperatures.

2. Large cakes and thick cakes are baked at lower temperatures.

3. Too high a temperature retards flavor and volume development.

4. Cake texture is improved if cakes are put into pre-heated ovens.

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT	CLASS ACTIVITY
5. Pans that touch in the oven reduce batter movement during baking and hinder proper cake development.	
6. Pans should not be placed against the oven sides where uneven heat occurs.	
7. Oven racks should be level.	
8. Oven heat should come mostly from the bottom and circulate up around the cakes for most products.	
9. If the oven is too hot, the outside of the cake will be baked before the interior is and the cake may be: a. tough and compact; b. have humps; c. show tunneling.	
10. Too cool an oven gives a crust that forms too late with cell walls that overexpand so that the cake is:	

LESSON CONTENT	CLASS ACTIVITY

a. flat, with a coarse, uneven grain;

b. has a pale, sticky crust;

c. may suffer oven-collapse.

VIII. PROPER COOLING IS CRITICAL TO QUALITY

A. Procedure For Cooling:

1. Remove from the oven; cool on a rack for 15 minutes or longer, depending on size and shape.
2. Free cake from the pan sides and invert onto racks.
3. Turn right side up by flipping onto another rack.
4. Remove them from pans while still slightly warm to dissipate bottom moisture and avoid sogginess.
5. Cool at room temperature; cooling cakes too quickly causes shrinkage.

LESSON CONTENT	CLASS ACTIVITY
B. Overcooling Before Removal Causes Cakes to Stick To Pan.	
C. Cool Loaf or Pound Cakes 30 Minutes, then Free Edges and Invert On a Rack.	
IX. STORAGE OF CAKES IS IMPORTANT IN MAINTAINING HIGH QUALITY.	
A. Store Cakes In a Clean, Covered, Cool Place To Avoid Drying.	
B. Mold Can Be a Problem In Warm, Humid Weather. Staling Is More Rapid Under Refrigeration, But To Avoid Mold, Cake May Be Refrigerated During Humid Weather.	
C. Freeze Cakes In Moisture-Proof Wraps To Retain Quality For Several Months.	
X. THE MAKEUP IS IMPORTANT TO CAKE QUALITY BECAUSE APPEARANCE AND FLAVOR MAY BE AFFECTED.	
A. Makeup Includes Final Preparation For Serving Which May Be Cutting, Shaping, Filling, Frosting, and Decorating.	

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT

CLASS ACTIVITY

B. Frostings and Icings

1. Icings are used on cakes to enhance appearance and flavor and maintain moistness; not all cakes require frosting.

2. Commonly used frostings are foam, meringue, or marshmallow creme, butter, plain water icings, glazes and fondants.

3. The frosting or filling should complement the cake and not overwhelm it. Never overfrost or overcolor!

   a. Foam frostings are often called boiled, or marshmallow, because they resemble soft marshmallow.

      (1) Heat sugar and water to 238°F to 350°F.

      (2) Add hot mixture to beaten egg whites.

      (3) Beat entire mixture until stiff.

LESSON CONTENT	CLASS ACTIVITY

b. Butter cream frostings may be classified as traditional or smooth butter creams.

(1) In the traditional butter cream frosting, add butter or margarine to confectioner's sugar. Add liquid and flavorings; beat the mixture until spreadable.

(2) In smooth butter cream frostings, add a thickening agent such as flour or cornstarch to the formula. Combine the flour or cornstarch with milk, cook until thickened and then cool and add to a butter-sugar mixture.

(3) Vary both types of butter cream frostings through the use of different flavoring ingredients, such as maple, orange or lemon. Other ingredients such as chopped cherries, peanut butter or pumpkin add variety as well, and so do small amounts of food coloring.

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT	CLASS ACTIVITY

c. Details on the content and preparation of other frostings such as fondants, plain water icings and glazes may be found in the reference text, Standards, Principles and Techniques in Quantity Food Production, by Lendal Kotschevar.

C. Icing Procedures

1. Before icing, remove crust from cakes and freeze the cake. A frozen cake is easier and neater to ice.

    a. Place a damp cloth over a cake and the crust rolls away more easily.

    b. Trim ragged edges and shape as required. Edges should be sharp. Brush away all crumbs before icing.

2. Have the icing at a proper consistency: not too thin to be runny nor too thick to pull away and break the cake.

3. Use pastel colors. The amateur is known by his excess of color, so moderation is the sign of a craftsman.

LESSON CONTENT	CLASS ACTIVITY
4. For a layer cake, invert the first layer top down. If there is a difference in layer thickness, place the thickest on the bottom.	
5. Spread fillings or frostings evenly over the first layer's bottom.	
6. Place the second layer right side up on this.	
7. Deposit a liberal supply of icing in the center of the top and work with a spatula to the sides, guiding the icing down the sides using the spatula.	
8. For some thick frostings it is preferable to start on the sides, spreading with a spatula from the bottom toward the top, turning the cake as the side is frosted and holding the spatula in a nearly vertical position to give a smooth side.	Distribute Handout #21-11 and review together the various ways cakes may be cut and portioned to give eye appeal and variety.
9. Make a smooth surface by dipping the spatula first into warm water and then smoothing out the frosting.	

LESSON 21 : CAKES AND COOKIES

LESSON CONTENT

CLASS ACTIVITY

10. If cakes are to be decorated, let them dry first so the frosting may set.

11. Techniques and guidelines used in decorating cakes is given in the Kotschevar reference.

XI. INGREDIENTS FOR COOKIES ARE MUCH THE SAME AS FOR CAKES. HOWEVER, MOST COOKIE DOUGHS HAVE MORE SHORTENING AND LESS SUGAR AND LIQUIDS.

A. Mixing Techniques Are Similar to Cakes.

1. Sugar, ice box and similar cookies are made by the conventional creaming method.

2. Foam-types are made by methods similar to those used for foam cakes, such as lady fingers.

B. The Amount of Baking Time Affects Cookie Crispness.

1. Soft cookies are usually baked for a shorter period of time.

2. Crisp ones are baked longer.

3. Thickness and size are also factors affecting crispness and softness.

LESSON CONTENT	CLASS ACTIVITY

C. Cookie Spread During Baking Is Affected By:

1. high sugar content which increases spread;
2. leaner doughs which spread less;
3. coarser sugar which increases spread;
4. powdered sugars which reduce spread.

D. Shaping or Portioning Cookie Dough Is Simple.

1. If rolling and cutting cookies must be done:
   a. use a canvas cloth for an underliner;
   b. roll the dough about $\frac{1}{8}$ inch thick;
   c. cut out as economically as possible, leaving little dough to rework since this toughens the product.
2. Use semi-soft batters for drop cookies:
   a. drop about 1 oz (#30 scoop) to 1½ oz (#20 scoop) for each cookie;

LESSON CONTENT	CLASS ACTIVITY
b. scoop and deposit by spoon or pastry bag; c. deposit dough approximately 2 inches apart on baking sheet. 3. Use level, clean baking sheets. a. Some need not be greased while others need liberal greasing and dusting with flour. Liberal greasing encourages cookie spread. b. Have sheet pans cool before placing cookie dough on them. E. Cookies Are Baked At Higher Temperatures Than Cakes. 1. Overbaking darkens the cookies and ruins their flavor. 2. Chocolate cookies burn easily. 3. When cookies are done, they are of the proper color and spring back slightly to the touch.	

4. After baking, protect cookies from drafts and too rapid cooling.

5. Remove most cookies from pans while still warm with a wet spatula or pancake turner. If cold, hold the baking sheets a moment over heat or put into a hot oven for 1 to 1½ minutes for easy removal.

F. Proper Storage Is Important In Maintaining Quality.

1. Most cookie batters or doughs freeze well, except foam types.

2. Stiff doughs should be thawed under refrigeration but softer mixes may be thawed at room temperature.

3. Do not pack cookies while warm.

4. Frozen baked cookies thaw in opened packages in about 15 to 20 minutes.

5. Sometimes a moist cut apple is stored with soft cookies to keep them moist.

6. Do not stack soft cookies. Store in single layers or with heavy paper between layers.

Divide participants into pairs and assign each couple one of the recipes to prepare on Handouts #21-3 through 21-10. Use the evaluation form on Handout #21-1 to judge the quality of each product prepared.

Note To Instructor: See the Instructor's Guide for this activity on Page 3 of Handout #21-1.

Handout #21-1

EVALUATION FORM FOR QUALITY CAKES AND COOKIES

Use the evaluation form below to judge the quality of the cake samples presented.

	Sample 1		Sample 2	
	Yes	No	Yes	No
BUTTER CAKES				
1. Even on all sides				
2. Slightly rounded on top				
3. Shiny crust, golden				
4. Crust tender, thin, smooth				
5. Cut surface fine, even grain				
6. Cut surface soft, tender				
7. No dullness or streaks on cut surface				
8. Moist crumb that is tender				
9. Mild flavor, sweet, delicate				
POUND CAKES				
1. Even shape				
2. Slightly rounded top				
3. Crust thin, soft				
4. Crust delicately browned				
5. Crust slightly split in middle				
6. Rich, smooth crumb, no oiliness				
7. Firm texture, fine, compact cells				
8. Flavor sweet, delicate, substantial				

	Sample 1		Sample 2	
	Yes	No	Yes	No
ANGEL FOOD CAKES				
1. Feathery, fine, even grain				
2. Moist grain				
3. Cell walls clear, white, with sheen				
4. Even sides				
5. Slightly rounded top				
6. Delicately browned crust				
7. Crust not moist or sticky				
SPONGE OR CHIFFON CAKE				
1. Texture delicate, springy, light				
2. Moist, soft crumb				
3. Delicate flavor				
4. Even grain, not coarse				
5. Not excessively feathery or moist				
6. Fine cells with soft sheen				
7. High, even shape				
8. Lightly browned crust				
COOKIES				
1. Appropriate color for type of cookie				

	Sample 1		Sample 2	
	Yes	No	Yes	No
COOKIES				
2. No over-brown edges or bottoms				
3. Crisp or soft as appropriate				
4. Appropriate spread during baking				
5. Appropriate size or portion				
6. Good overall appearance				

Handout #21-1

INSTRUCTOR'S GUIDE FOR CAKE AND COOKIE PREPARATION

1. Allow 20 to 30 minutes for participants to become familiar with the kitchen to be used, the location and operation of equipment, and the location of ingredients needed for the preparation of assigned recipes.

2. Divide participants into pairs and give each couple one of the recipes on Handouts #21-2 through #21-10, to prepare.

3. Ask each pair to first adjust the base recipe yield as noted on the top of the recipe. Ask them to use the Factor Method for adjusting this recipe as was described in Lesson 2 on Standardized Recipes. The adjusted recipe ingredient amounts should be written in the blank column provided on each recipe.

4. After all products have been prepared, evaluate them using the form on Handout #21-1. Evaluation can be done by those who prepared each product or by other class participants.

5. Allow adequate time for products to be prepared, cooled and evaluated.

6. While products are cooling or chilling, clean up the kitchen facility used and set up tasting forks and small liners to use during the evaluation of the products prepared.

Handout #21-2

PRODUCTION SCALING WEIGHTS, BAKING TEMPERATURES AND TIMES FOR CAKES

Type of Cake	Batter Scaling Weight	Baking Temperature (°F)	Baking Time (min)
1. LAYER			
A. Butter or Pound (1½ to 2 inches deep)			
6-inch diameter	6 to 8 oz	375	18
7-inch diameter	9 to 11 oz	375	20
8-inch diameter	12 to 14 oz	375	25
10-inch diameter	20 oz	360	35
12-inch diameter	1½ to 2 lb	360	
14-inch diameter	2½ to 3 lb	360	
B. Foam Cakes			
6-inch diameter	4 to 5 oz	375	20
8-inch diameter	9 to 10 oz	375	
10-inch diameter	16 to 18 oz	360	
12-inch diameter	1½ to 1 3/4 lb	360	
II. LOAF			
Pound, 3½ x 3½ x 8 in.	1 lb	355	50
Pound, 3½ x 6 x 11 in.	3 lb	325	100
Fruit, 3½ x 3½ x 8 in.	1½ lb	315	90
Angel, 3½ x 3½ x 8 in.	7 to 10 oz	365	
Angel, tube, small	8 to 10 oz		
Angel, tube, 10 in.	1½ to 2 lb	360	50

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Handout #21-2/Page 2

Type of Cake	Batter Scaling Weight	Baking	
		Temperature (°F)	Time (min)
III. SHEET			
Butter, 1 x 18 x 26 in.	6 to 7 lb	360	35
Butter, 3 x 18 x 26 in.	8 to 10 lb	350	
Sponge, 1 x 18 x 26 in.	3 lb	360	25
IV. MISCELLANEOUS			
Ring, 6½-in. diameter	10 to 14 oz	375	
Oval loaf, 6 3/4 in.	8 oz	375	
Cupcakes, butter, per doz.	14 to 16 oz	385	
Cupcakes, foam, per doz.	7 to 8 oz	375	

Weights, times and temperatures are average only, and should be adjusted for your particular cake recipe as directed.

Adapted from: Standards, Principles and Techniques in Quantity Food Production, Kotschevar.

Handout #21-3

ANGEL FOOD CAKE

10-inch tube cut in 12 Desserts 21-3

INGREDIENTS	AMOUNT (72 portions)		PROCEDURE
Flour, cake Sugar	1 lb 10 oz 3 lb 10 oz		Sift flour and sugar together 4 times. (See step 5 below)
Salt Egg Whites	2 tsp 2 qts		Add salt to egg whites. Using balloon whip, beat until frothy on number 3 speed.
Cream of Tartar	2 Tbsp 2 tsp		Add cream of tartar and continue beating until whites are stiff enough to hold their shape yet still have their shiny appearance.
Vanilla Almond Extract, optional	2 Tbsp 1½ tsp		Add flavorings.
NOTE: FOR VANILLA BUTTER CREAM FROSTING, SEE PAGE 2 of #21-3			Remove bowl from machine. Carefully fold in combined flour and sugar by sifting. (Sift through a sifter for the fourth sifting directly into egg whites.)
			Into ungreased angel cake pans which have been rinsed with cold water and dried, pour 1 lb 8 oz batter.

Handout #21-3 (continued)

INGREDIENTS	AMOUNT (72 portion)		PROCEDURE
			Cut batter in pan with spatula around edge of pan. This will remove large bubbles.
			Bake in a slow oven, 275°F for 1 to 1¼ hours, or bake in a moderate oven, 300°F to 350°F for 35 to 45 minutes.
			After removing from oven, turn cake immediately upside-down until thoroughly cold.

Cost Per Serving:____________________

Total Production Time:____________________

Adapted from: Hardwick, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages. Cahners Publishing Co., A Division of CBI Publishers, Inc., Boston, MA, 1975.

Handout #21-3/Page 2

VANILLA BUTTER CREAM FROSTING

			DESSERTS 21-3
INGREDIENTS	AMOUNT		PROCEDURE
	(2 qt 1 cup)		
Butter or Margarine, soft Egg yolks Sugar, confectioners	10 oz 4 (or 3/8 cup) 3 lb 4 oz		Add butter or margarine and egg yolks to confectioner's sugar in bowl of mixer.
Cream, heavy	1 cup		Add cream all at once. Using flat beater, mix on number 2 speed for 3 to 5 minutes or until light and fluffy.
Vanilla	2 Tbsp		Add vanilla and beat again until well mixed. Put 1½ cups frosting on chiffon, sunshine or angel cakes. Put 1½ cups frosting on each 9 x 13 pan. Put 1½ cups frosting on each 2 layer cake. Put 1 qt 2 cups frosting on each 18 x 26 x 1 pan.

VARIATIONS

ORANGE, LEMON OR LIME FROSTING

1. Omit cream and vanilla from Vanilla Butter Cream Frosting recipe on facing page.
2. Substitute orange, lemon or lime juice for the heavy cream.
3. Substitute orange, lemon or lime rind for the vanilla in the same amounts.

Cost Per Serving: ____________________

Total Production Time: ____________________

Adapted from: Hardwick, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing, CBI Publishers Inc., Boston, MA.

Handout #21-4

CHOCOLATE CHIFFON CAKE

10-inch tube pan cut in 10			DESSERTS 21-4
INGREDIENTS	AMOUNT		PROCEDURE
	4 cakes-40 serv.		
Cocoa Water, boiling	6½ oz 2 cups		Add boiling water gradually to cocoa, stirring constantly with wire whip until smooth and well-blended. Set aside to cool until mixture is no longer hot.
Flour, cake Sugar Baking powder Salt	13 oz 1 lb 8 oz 1½ oz 2 3/4 tsp		Sift flour, first amount of sugar, baking powder and salt into bowl of mixer. Make a depression in the center of the flour mixture.
Oil, salad Egg Yolks Vanilla Red coloring	1 1/3 cups 1½ cups 2 3/4 tsp 3/4 tsp		Add in order the oil, egg yolks, vanilla, red coloring and the cooled chocolate mixture.
			Using the flat paddle, mix on number 1 speed just until ingredients are thoroughly combined, approximately 1 to 2 minutes. Scrape down sides and bottom of bowl.

Handout #21-4/Page 2

INGREDIENTS	AMOUNT		PROCEDURES
	4 cakes-40 serv		
Egg whites Cream of Tartar	2 3/4 cup 1¼ tsp		In another bowl using balloon whip, beat egg whites and cream of tartar on number 3 speed until frothy.
Sugar	9 oz		Add the second amount of sugar gradually and beat until egg whites are very stiff.
			Pour cake batter 1/3 at a time over egg whites and fold with a large wire whip only until thoroughly combined. Weigh 1 lb 12 oz into each ungreased tube pan.
NOTE: Do not make more than 8 cakes at a time. Cakes should be baked one day in advance.			Cut through the batter with a knife in a zigzag fashion several times to even batter and to break up any air bubbles. Bake at 350°F for 35 to 40 minutes. Invert immediately and allow to cool thoroughly before removing from pans. Remove cakes from pans, brush off any loose crumbs, place top side down on plate and frost with Whipped Frosting.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing, CBI Publishers, Inc., Boston, MA.

WHIPPED FROSTING

			DESSERTS 21-4
INGREDIENTS	**AMOUNT**		**PROCEDURE**
	2 qt 2 cups		
Margarine Shortening	10 oz 10 oz		Using flat beater, cream margarine and shortening on number 2 speed until well-mixed.
Sugar Flour, all-purpose Milk	1 lb 4 oz 5 oz 2¼ cups		Add sugar gradually and continue creaming. Combine flour and milk, mixing until smooth. Heat, stirring constantly, until mixture is VERY thick. Remove from heat.
Sugar, confectioner's Vanilla	6 oz 1 Tbsp		Cool to just lukewarm. Add flour-milk paste, confectioner's sugar and vanilla to creamed mixture. Whip again until very light and fluffy, or cream 5 to 10 minutes more.

NOTE 1: Resulting product should look like whipped cream.

NOTE 2: This formula is satisfactory for use in decorating with a pastry tube and for use in place of hard sauce.

Cost Per Serving: ____________________
Total Production Time: ____________________

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishers, Inc., Boston, MA

Handout #21-5

OLD-FASHIONED PEANUT BUTTER CAKE

9 x 13 pan--cut 5 x 3 OR 18 x 26 pan--cut 10 x 6		DESSERTS	21-5
INGREDIENTS	**AMOUNT**		**PROCEDURE**
	*4 pans-60 serv.		
Butter or margarine Peanut Butter Sugar	10 oz 12 oz 2 lb 4 oz		Using flat beater, cream butter or margarine, peanut butter and sugar on number 2 speed.
			Cream for 15 minutes. Scrape down sides and bottom of bowl every 5 minutes.
Flour, all-purpose Soda Baking powder	1 lb 14 oz 1 oz 1 oz		While mixture is creaming, grease pans. Weigh and sift flour, soda and baking powder.
Eggs	6, or 1 cup		Add eggs to creamed mixture on number 1 speed and then cream on number 3 speed for another 5 minutes or until fluffy.
Vanilla	2 Tbsp		Add vanilla.

*1 pan = 60 servings

Handout #21-5/Page 2

INGREDIENTS	AMOUNT		PROCEDURES
	*4 pans-60 serv.		
Buttermilk	1 qt 1 cup		Add sifted dry ingredients on number 1 speed alternately with buttermilk in thirds, beginning and ending with flour mixture. Scrape down bowl after each addition.
*1 pan = 60 serv. SEE FOLLOWING PAGE FOR BOILED FROSTING			Weigh 2 lb batter in greased 9 x 13 pans. *Weigh 8 lb batter in greased 18 x 26 x 1 pans. Bake at 350°F for 30 to 35 minutes or until cake is lightly browned. NOTE: If a cake with greater height is desired, put 2 lb 8 oz batter in each 9 x 13 pan.

Cost Per Serving: ____________________

Total Production Time: ________________________ 9/30/81

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishers Inc., Boston, MA.

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Handout #21-5 (continued)

BOILED FROSTING

			DESSERTS 21-5
INGREDIENTS	AMOUNT		PROCEDURE
	2 cakes-4 layers		
Sugar Salt Water	1 lb 1¼ oz ¼ tsp 2/3 cup		Cook the sugar, salt and water together to 238°F (soft-ball stage) or until the syrup spins a thread. The utensil should be covered for a few minutes after boiling begins to wash down the crystals that collect on the side of it.
Egg whites	3/4 cup		Beat the egg whites until stiff but not dry.
			Pour the hot syrup slowly onto the egg whites, beating continually until cool.
Vanilla	1 tsp		Add vanilla.

NOTE: this icing may be used immediately or held in the refrigerator, covered with waxed paper, for several days.

Cost Per Serving:___________________

Total Production Time:________________________ 9/30/81

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishing, Inc., Boston, MA.

Handout #21-6

GOLDEN SPONGE CAKE

9 x 13 pan--cut 4 x 3			DESSERTS 21-6
INGREDIENTS	AMOUNT *4 pans-48 serv.		PROCEDURE
Eggs, whole	12, or 2½ cups		Using balloon whip, beat whole eggs on number 3 speed for about 5 minutes or until light and thick.
Sugar, sifted	2 lb 10 oz		While eggs are beating, weigh and sift sugar. Add sifted sugar GRADUALLY to eggs, continuing to beat on number 3 speed for 10 to 15 minutes. Scrape down sides and bottom of bowl every 5 minutes.
Butter Milk, hot	4½ oz 3 cups		Melt butter in the hot milk. DO NOT OVERHEAT THE MILK.
Flour, cake Baking powder Salt	1 lb 4 oz 1 3/4 oz 1 Tbsp		Sift the flour, baking powder and salt twice.
Vanilla	1 Tbsp		On number 1 speed, add the sifted dry ingredients to the eggs alternately with butter and milk mixture. Add in two portions. Add vanilla. Mix until no flour lumps remain. BATTER WILL BE RUNNY.
*OR 9 x 13 pan cut 5 x 3, 60 portions.			

Handout #21-6/Page 2

INGREDIENTS	AMOUNT *4 pans-48 serv.	PROCEDURE
NOTE: SEE FOLLOWING PAGE FOR SATIN ~~CHOCOLATE~~ FROSTING		Grease pans ON BOTTOM ONLY. Weigh 1 lb 8 oz batter into greased pans. Bake at 350°F for 20 to 25 minutes. This cake shrinks somewhat after it is removed from the oven. May be served with fresh strawberries or peaches for shortcake or serve as a cake square with ice cream or frosted.

Cost Per Serving: ________________

Total Production Time: ____________________ 9/30/81

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishers, Inc., Boston, MA.

Handout #21-6 (continued)

SATIN CHOCOLATE FROSTING

DESSERTS 21-6

INGREDIENTS	AMOUNT		PROCEDURE
	1 qt 3 cups		
Milk, hot Butter or margarine Chocolate, bitter Salt	3 cups 2 oz 8 oz ¼ tsp		Heat first amount of milk, butter or margarine, chocolate and salt together until chocolate is melted.
Cornstarch Milk, cold	4 oz 1 cup		Dissolve cornstarch in cold milk. Stir with a wire whip.
Sugar	1 lb 12 oz		Add sugar and dissolved cornstarch to chocolate mixture. Cook until blended and stiff, stirring constantly with a wire whip.
Vanilla	1 Tbsp 1 tsp		Add vanilla. If not smooth, beat with flat paddle in bowl of power mixer.

Cost Per Serving: ____________________

Total Production Time: ______________________ 9/30/81

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishers, Inc., Boston, MA.

Handout #21-7

DUTCH APPLE UPSIDE-DOWN CAKE (FRESH APPLES)

9 x 13 pan--cut 5 x 3			DESSERTS 21-7
INGREDIENTS	AMOUNT		PROCEDURE
	2 pans-30 serv.		
NOTE: 1. Apples may be prepared a day ahead or first thing in the morning. 2. If apples are sweet, as in the spring, decrease amount of sugar used to one-half the amount listed below. 3. If apples are tart, as in the fall, use the amount listed here. 4. All ingredients for cake batter should be at room temperature. *5. This gold cake batter may also be used for Pineapple Upside-Down Cake.			
To Prepare Apples Apples, fresh, AP, peeled & sliced Sugar Water	 2 lb 7 oz 1 cup		Peel and slice apples. Cover and cook in first amount of sugar and water for 10 minutes or until apples are soft and almost all water is absorbed. Set aside to cool. Refrigerate if prepared a day ahead.
To Prepare Cake Butter Sugar	 10 oz 1 lb 4 oz		Using flat beater, cream butter and second amount of sugar on number 2 speed.
			Cream for 15 minutes. Scrape down sides and bottom of bowl every 5 minutes.

INGREDIENTS	AMOUNT		PROCEDURE
	2 pans-30 serv.		
Flour, cake Baking powder Salt	1 lb 4 oz 1 oz 1 tsp		While mixture is creaming, grease pans. Weigh and sift flour, baking powder and salt.
Eggs	5 or 1 cup		Add eggs to creamed mixture on number 1 speed and then beat on number 3 speed until mixture is smooth.
Vanilla	1 Tbsp		Add vanilla.
Milk	2½ cups		Add sifted dry ingredients on number 1 speed alternately with milk in thirds, beginning and ending with flour mixture. Scrape down bowl after each addition. Put 2 cups cooked apples in each greased 9 x 13 pan. Put 1 qt 2 cups cake batter on top of apples in each pan. Spread batter evenly to corners. Bake at 350°F for 35 to 40 minutes or until golden brown. Test center of cake. If knife comes out clean, cake is done. Serve this cake upside-down from pan. Do not invert whole cake. Serve with Golden Sauce or Cider Sauce.

<table>
<tr><th colspan="4">*PINEAPPLE UPSIDE-DOWN CAKE</th></tr>
<tr><th rowspan="2">INGREDIENTS</th><th colspan="2">AMOUNT</th><th rowspan="2">PROCEDURE</th></tr>
<tr><th>2 pans-30 serv.</th><th></th></tr>
<tr><td>Pineapple, crushed, drained</td><td>1 qt</td><td></td><td>Put 2 cups well-drained, crushed pineapple in each 9 x 13 pan.
Follow directions above for amount of batter per pan and for baking.</td></tr>
<tr><td colspan="4">SEE FOLLOWING PAGE FOR DUTCH APPLE UPSIDE-DOWN CAKE (CANNED APPLES)</td></tr>
<tr><td colspan="4">Cost Per Serving: ____________________
Total Production Time: __________________________ 9/30/81</td></tr>
</table>

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishers, Inc., Boston, MA.

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Handout #21-7 (continued)

DUTCH APPLE UPSIDE-DOWN CAKE (CANNED APPLES)

9 x 13 pan--cut 5 x 3 DESSERTS 21-7

INGREDIENTS	AMOUNT		PROCEDURE
	3 pans		
To Prepare Pans: Butter or margarine, melted	8 oz		Put 2 3/4 oz or 1/3 cup butter or margarine in each 9 x 13 pan. Heat in oven until melted.
Sugar	1 lb 2 oz		Spread 6 oz sugar evenly over melted butter or margarine in each pan.
Apples, canned	½ No. 10 can		Put 2½ cups apples evenly over top of butter and sugar mixture.
To prepare cake:			Use cake formula for Dutch Apple Upside-Down Cake. Because more canned apples are placed in each pan than fresh apples, the batter amount has been decreased. Put 1 qt batter in each pan when using canned apples. Do not turn cake out of pan upside down. Serve directly from pan.

Cost Per Serving: ____________________

Total Production Time: ________________________ 9/30/81

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishers, Inc., Boston, MA.

Handout #21-8

CHOCOLATE CHIP COOKIES

2-inch round cookie			DESSERTS 21-8
INGREDIENT	AMOUNT		PROCEDURE
	96 cookies		
Butter or margarine Sugar, granulated Sugar, light brown	1 lb 8 oz 8 oz		Using flat beater, cream shortening and sugars together for 15 minutes on number 2 speed.
Eggs Vanilla	4 2 tsp		Add eggs and vanilla and beat for another 5 minutes.
Soda Water, hot	½ tsp 1 Tbsp 1 tsp		Dissolve soda in hot water and add. Mix.
Flour, all-purpose Salt	1 lb 4 oz 3/4 tsp		Sift flour and salt.

Handout #21-8/Page 2

INGREDIENTS	AMOUNT		PROCEDURE
	96 cookies		
Chocolate Morsels Walnuts, English ¼-3/8 inch pieces, optional	1 lb 8 oz		On number 1 speed, add flour, salt, nutmeats, and chocolate morsels. Mix about 1 minutes until all ingredients are incorporated. Using a level #50 scoop (1 oz), drop cookies about 2 inches in diameter. Bake at 325°F for 12 minutes. This gives a cookie about 2 inches in diameter.

Cost Per Serving:____________________
Total Production Time:________________________ 9/30/81

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishers, Inc., Boston, MA

Handout #21-9

NO BAKE COOKIES

#40 Scoop			DESSERTS 21-9
INGREDIENTS	AMOUNT		PROCEDURE
	48 portions		
Sugar Butter or margarine Cocoa Milk	1 lb 12 oz 8 oz ½ oz 1 cup		Combine sugar, shortening, cocoa and milk in steam kettle and cook until shortening melts and entire mixture comes to a simmer.
Rolled Wheat or oatmeal Peanut Butter Nuts, chopped, optional	1 lb 4 oz 8 oz 4 oz		Add rolled wheat, peanut butter and nuts, if used.
			While hot, scoop with #40 scoop onto pan lined with waxed paper 6 x 8 on 14 x 18 tray or 12 x 8 on sheet pan. Chill in refrigerator until cool and stiff. NOTE: Coconut or chopped cherries may be added for variety or coconut or cherries may be substituted for nuts.

Cost Per Serving: ____________________
Total Production Time: ___________________________ 9/30/81

Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CB "Publishers, Boston, MA.

Handout #21-10

CINNAMON RAISIN BARS

Cut 6 x 8 (Large)*			DESSERTS 21-10
INGREDIENTS	AMOUNT		PROCEDURE
	96 bars*		
Flour, all-purpose Sugar Salt Soda Cinnamon Ginger Eggs Molasses Raisins Shortening	5 lb 2 lb 8oz 1½ oz 1½ oz 1½ oz 2 Tbsp 15, or 3 cups 1 qt 3 lb 12 oz 1 lb 12 oz		Combine all ingredients as listed into bowl of mixer.
*Cut 12 x 8-small = 192 bars			Using flat beater, mix on number 2 speed for 3 to 5 minutes or until dough is smooth.

INGREDIENTS	AMOUNT	PROCEDURE
		Divide evenly into pans, approximately 8 lbs per pan. With floured hands, press dough to edges of pans until it is smooth and even. This is a very stiff dough. Bake at 400°F for 15 to 20 minutes. Cut into squares. If serving raisin bar along with another dessert, serve a small bar. If served alone, serve the larger bar or two smaller ones.

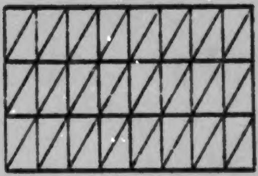
Cost Per Serving: ____________________

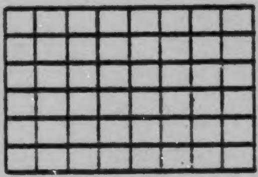
Total Production Time: _________________________ 9/30/81

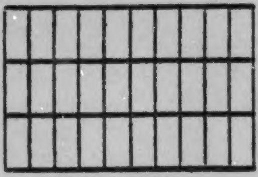
Adapted from: Hardwich, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Co., CBI Publishers, Boston, MA.

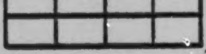
Handout #21-11

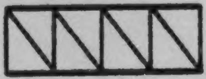
VARIOUS WAYS TO CUT CAKES

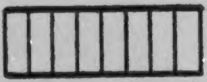

18" x 25"
Yield: 48 servings

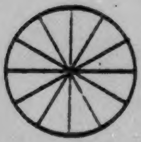

18" x 25"
Yield: 48 servings

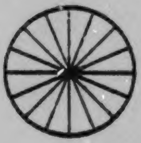

9" x 13"
Yield: 30 servings

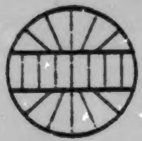

1 pound loaf cake
Yield: 8 servings

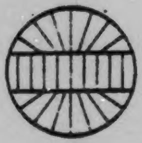

1 pound loaf cake
Yield: 8 servings

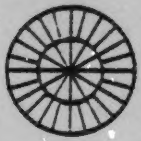

1 pound loaf cake
Yield: 8 servings

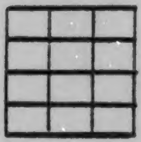

8" 2 layer cake
Yield: 12 servings

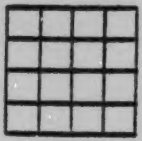

9" 2 layer cake
Yield: 16 servings


10" 2 layer cake
Yield: 20 servings


11" 2 layer cake
Yield: 26 servings


12" 2 layer cake
Yield: 36 servings


9" x 9"
Yield: 12 servings


9" x 9"
Yield: 16 servings

Adapted from Standards, Principles, and Techniques in Quantity Food Production by Kotschevar.

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LESSON 22 : OTHER DESSERTS AND PUDDINGS

A. GOAL OF THIS LESSON

The goal of this lesson is to understand the basic techniques for preparing and serving puddings, fruit desserts, egg-thickened desserts, and gelatins.

B. PURPOSE OF THIS LESSON

After completing this lesson, participants should be able to:

1. describe puddings and their differences
2. describe ways to use fruit as a dessert
3. describe preparation techniques for custards
4. describe preparation techniques for gelatin
5. describe ways to vary the gelatin dessert
6. describe ways to store and serve frozen desserts
7. describe preparation techniques for crepes
8. describe preparation techniques for fried cakes

C. INSTRUCTOR PREPARATION FOR CLASS ACTIVITIES

1. Duplicate sufficient copies of all handout materials.
2. Locate a chalk board for use in the classroom.

3. Arrange for use of a quantity kitchen for participants to use and arrange for purchase of ingredients needed to prepare sample recipes in Handout #22-2 through 22-17. If a kitchen is not available, arrange for sample products to be prepared or purchased.

D. KEY WORDS USED IN THIS LESSON

SYNERESIS: the breakdown and/or separation of water and coagulated protein found in overheated food products, such as custards.

EMULSION: a condition where small amounts of one liquid are finely dispersed in another so as to be held in suspension; no separation of the two liquids occurs.

GEL: the semi-solid end product in gelatin preparation.

BLOOM: a bright, smooth sheen.

ROPINESS: a condition found in breads caused by a bacteria which digests the crumb of bread into a sticky, pasty mass that has a dark color and an odor similar to that of an over-ripe canteloupe; when pulled apart, it will stretch into "ropes" or silky threads.

E. REFERENCES FOR ADDITIONAL INFORMATION

Kotschevar, Lendal H. Standards, Principles and Techniques in Quantity Food Production, Chapter 14. (See Lesson)

West, B. B., Shugart, G. S., and Wilson, M. F. Food for Fifty.

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT

CLASS ACTIVITY

I. THERE ARE MANY TYPES OF POPULAR PUDDINGS.

- A. Most Puddings Are:
  1. easily made in quantity
  2. low in cost
  3. require little labor
- B. Some Are Almost Like Cakes.
  1. served either hot or cold
  2. served with or without a sauce
- C. Starch-Thickened Puddings
  1. Blanc mange or cornstarch pudding is made from hot milk, sugar, vanilla, and a bit of salt with cornstarch or other starch for a thickener.
  2. Cream puddings are made with the same ingredients as blanc mange, but eggs are also added to the mixture.

LESSON CONTENT	CLASS ACTIVITY
3. Tapioca pudding is made by adding tapioca to milk or fruit juices and cooking to thicken. Overmixing causes ropiness and lowers quality. 4. A tapioca cream pudding is made in a similar manner, but eggs are added to the formula. D. Steamed (or Boiled) Puddings 1. Are usually served warm with a sauce. 2. May approximate pound cakes in texture. 3. The leavening agent is usually soda which gives a porous texture and darkens the fruit, nuts, molasses or other ingredients in the batter. 4. More detail on these puddings may be found in the reference Standards, Principles and Techniques in Quantity Food Production, by Kotschevar.	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT

CLASS ACTIVITY

II. **MANY DESSERTS ARE MADE WITH FRUITS IN VARIOUS WAYS.**

A. The Simplest and Finest Dessert Is Fruit.

1. Fresh fruits:

   a. should be tart, yet sweet and full of flavor

   [illegible] should be served cold

   c. may be served plain, dipped in powdered sugar, or with milk and sugar

   d. may be crushed and served over custard, pudding or cake

   e. may be served whole, halved or in pieces.

2. Frozen fruits

   a. are best served with some ice still in them to give them better texture

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LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
b. usually come sweetened with sugar in the ratio of berries to sugar, 4 to 1 c. have best quality if used soon after thawing 3. Canned fruits: a. may be served drained or with some syrup from the can b. should be served chilled 4. Cooked fruits: a. are stewed fruit or sauce, if cooked in a light or medium syrup b. are compotes, if cooked in a heavy syrup c. are preserves, if cooked in an extremely heavy syrup	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
B. Fruit crisps: 1. are best served warm with a light fruit sauce or whipped topping 2. frequently are made with small quantities of leftover fruits 3. are a layer of fruit topped with a mixture of flour, sugar and fat, and baked 4. sometimes are made with oatmeal rather than flour 5. should have a crisp top with a soft fruit underneath C. Fruit betties: 1. are best served warm with a light fruit sauce or whipped topping 2. frequently are made with small quantities of leftover fruits	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
3. consist of layers of fruit, butter and sugar, separated by layers of cake crumbs	
4. are baked so that the interior and bottom are soft fruit and crumbs while the top is crisp	
D. Biscuit fruit desserts	
1. shortcakes are popular biscuit-type fruit desserts made of a richer, sweeter biscuit dough, served with crushed fruit and whipped topping or cream	
2. cobblers are fruit topped with a layer of biscuit or pie pastry dough and baked	
3. fruit rolls are made by placing fruit over biscuit dough and rolling it as is done for a cinnamon roll, then slicing inch-thick slices and baking them on a greased pan	
4. a roly-poly is the whole fruit roll baked with slices cut AFTER it is baked	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY

5. a fruit dumpling is rich biscuit dough about ^{1}/8-inch thick that is filled with fruit with the edges of the dough folded over to make a tight seal around the fruit before they are steamed or baked

III. EGG-THICKENED DESSERTS INCLUDE CUSTARDS, SOUFFLES AND MERINGUES.

A. Dry Mixes

1. can be boiled

2. are on the market

3. considerably simplify the preparation of these desserts

4. few operations today make their own custards from scratch

B. Preparation of Custard

1. A conventional baked custard is made with 1¼ to 2 pounds of whole eggs per gallon of liquid.

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
2. Some recipes may specify a small quantity of flour or other starch besides eggs. 3. Baking temperatures are between 325°F and 340°F. 4. The cut surface is even and sharp, possessing a soft sheen of a creamy tan; top is delicately browned. 5. The baking pan should be put into shallow pans of water (water bath) so that the direct oven heat does not cause syneresis. 6. Custards cook after they come from the oven, so they are usually removed before they are completely done. 7. Is completely cooked when the tip of a pointed knife comes out clean. 8. May be steamed, but should be covered to keep condensate out of the product. 9. For best results, have the milk hot and the final temperature of the custard at 140°F going into the oven.	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY

10. To stop cooking after oven removal, set custard pan in a well-aerated place or into a pan of cold water. Do not leave in the water bath.

11. Stirred or soft custards are similar to baked ones in ingredients, but are stirred instead of baked, and when cool have the consistency of thin to medium white sauce.

C. A Baked Soufflé:

1. is a dessert thickened and leavened by eggs

2. is so delicate that it is usually prepared to order, since it may collapse if left to stand for any length of time

3. is a dessert that is not practical for Child Nutrition Programs

D. A Meringue:

1. is an emulsion of air cells dispersed in a heavy egg and sugar syrup

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
2. Hard meringues are used as a base for desserts, while soft ones are used for toppings for pies, puddings and other desserts.	
3. For details on the preparation of meringues, see the reference, Standards, Principles and Techniques in Quantity Food Production, by L. Kotschevar.	
IV. GELATINS	
A. Are Easily Made, Have a Low Labor and Food Cost, and Lend Themselves to Attractive Presentation and Merchandising.	
B. Gelatins Are Well-Adapted to Blend With Fruits, Juices or Other Foods Left Over From Preparation of Other Products.	
C. Gelatins Store Well and Are Not Highly Perishable.	
D. Preparation Techniques For A High Quality Gelatin Product:	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
1. Use only high quality gelatins that have bright sparkle, clean color, good setting ability and a true, pleasing flavor. 2. Gelatins vary in setting strength, but normally a 2% solution gives a satisfactory gel. 3. Sugar increases the firmness of a gel, while acids decrease it. 4. Chopped ingredients weaken a gelatin structure. 5. Gelatin sets between 48°F and 57°F. a. Cooling slowly to 100°F and then refrigerating until the mixture is 40°F takes from 1½ to 2 hours, but gives a firmer product. b. For rapid setting, add a fourth or a half of the liquid to dissolve gelatin, and then add crushed ice in a measure filled with water to give the additional liquid required. Stir the ice until melted.	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
6. Unflavored gelatin must be soaked in cold liquid for about 5 minutes before dissolving it. To dissolve it, gelatin goes into solution at 100°F slowly, but normally 170°F or higher will obtain a more rapid solution.	
7. Uncooked pineapple, figs, papaya and a few other fruits contain enzymes that digest gelatin, so they must be cooked before being used with gelatin mixtures.	
8. Allowing a gelatin mixture to partially set before ingredients are added will keep them from floating to the top.	
9. A gelatin should be whipped when it becomes syrupy; set it in a bed of crushed ice while whipping. Items may be folded into foams after whipping.	
E. Plain Flavored Gelatin Can Be Made Into A Variety of Desserts.	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
1. After setting, it may be riced, or cubed and served plain or with a topping. 2. Beaten to a light foam. 3. Poured over cake cubes or crumbs; it should be at the syrupy stage when poured to prevent soaking. 4. Blended with whipped egg whites, whipped cream, blanc manges, cream puddings or melted ice cream to make a variety of interesting desserts. 5. Chill until syrupy and then whip until the volume doubles to make a snow or sponge. a. Shredded pineapple or applesauce is used for a pineapple or apple snow. b. Beaten egg whites are sometimes folded into the whipped gelatin to give a lighter texture. c. Snows or sponges may be served with a stirred custard.	

LESSON CONTENT

CLASS ACTIVITY

6. Fold whipped cream into a sweetened gelatin mixture to make a bavarian.
    a. The best bavarians contain milk instead of water as the liquid base.
    b. Cooked rice or cake crumbs, ground nuts or fruits may be added for variety.
    c. Bavarians can also be made using a blanc mange or cream pudding, a gelatin mixture, and beaten egg whites, whipped cream or soft ice cream.

V. FROZEN DESSERTS ARE POPULAR AND IF PURCHASED PREPARED, TAKE LITTLE PRODUCTION LABOR TO HAVE THEM AVAILABLE FOR SERVICE.

A. Many Types of Frozen Desserts

1. Ice cream, sherbet and ices are mixtures frozen by mechanical freezers which whip air into them as they freeze.

LESSON CONTENT	CLASS ACTIVITY

2. Desserts such as mousse, parfait, frozen pudding or frozen fruits are not whipped during freezing, but are whipped either before freezing or not at all.

3. Slushes are only partially frozen, and are coarse and granular.

4. Ice creams will vary a great deal.

   a. Vanilla ice cream must be 10% or more milk fat to be called ice cream.

   b. If fruit, nuts, chocolate or other products are added, the milk content can be no less than 8%.

   c. Milk fat gives ice cream its richness, and is an indication of quality, with the price directly related to that factor.

   d. If eggs are added to the mixture, it is French ice cream, and frequently there is ground vanilla added which shows up as slight specks of dark brown in the product.

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
B. Quality Standards For Ice Cream 1. Flavor should be pleasant and true, with proper acidity and sweetness. 2. Texture should be smooth, with a fine grain or creaminess evident. 3. Defective texture is described as fluffy, weak, crumbly, watery, icy, soggy, or gummy. 4. Body is associated with the "feel in the mouth." a. should not be too heavy or pasty nor open or frothy b. slight firmness is desirable 5. Appearance should be bright and smooth with a good bloom (a bright smooth sheen).	

LESSON CONTENT	CLASS ACTIVITY
6. Some frozen desserts may contain excessive amounts of starch paste, gums or other fillers to build body and texture, or otherwise to mask inferior qualities:	

6. Some frozen desserts may contain excessive amounts of starch paste, gums or other fillers to build body and texture, or otherwise to mask inferior qualities:
    - a. when product is thawed, this shows up because the product still retains its frozen shape
    - b. very little liquid appears
    - c. the best products thaw completely into a liquid

C. Proper Service of Ice Cream

1. Store frozen desserts at 0°F or lower; serve from 8°F to 15°F.
    - a. Below or above these service temperatures, a packed and less flavorful product results.
    - b. Remove items from frozen storage to the proper temperature service cabinet at least 24 hours before serving to condition them to the proper serving temperature.

LESSON CONTENT

CLASS ACTIVITY

2. Scooping incorrectly as well as having the dessert at the wrong temperature destroys texture.

3. Normal scooping shrinkage is 40 to 45% the result of packing of the ice cream during dipping and from melting.

4. Have scoops clean and smooth, possessing a sharp edge without nicks.

5. Dip scoop into clear water before scooping and then drain for a moment on a clean sponge or pad. If the scoop is not drained, small drops of water will freeze in the ice cream, giving an undesirable product.

6. To properly scoop ice cream, follow these steps.

   a. Insert the scoop about half an inch deep into the ice cream, starting at the outer edge, or where the last scoop left off.

LESSON CONTENT	CLASS ACTIVITY
b. Draw the scoop lightly and evenly across the surface, rolling the dessert into a ball.	
c. When the scoop is filled, turn up with a twist of the wrist, breaking off the ice cream.	
d. Keep the surface smooth, working evenly across the top of the ice cream.	
VI. FRIED DESSERTS INCLUDE FRITTERS, CREPES AND DOUGHNUTS.	
A. Fritters Are Usually Deep-Fried, But Occasionally May Be Pan-Fried.	
1. Many are simply fruit, such as bananas, dipped into a batter and fried.	
2. Other fritters may be muffin mixtures containing leavening agents into which fruits are mixed, such as blueberry fritters.	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY
3. There are many variations, and they are often served with a syrup.	
B. Crepes Are Made From A Thin Batter Thickened Slightly With Flour.	
1. Crepes as an entrée and as a dessert have gained more popularity in recent years.	
2. Preparation of crepes is simple and may be done in advance:	
a. Do not use leavening agent in the batter.	
b. Pour only enough into a hot seasoned pan to cover the bottom with a thin coating.	
c. Cook rapidly.	
d. When the bottom is nicely browned, turn and brown the other side.	
e. Since the second side never browns as well, it should be on the inside at service.	

LESSON 22 : OTHER DESSERTS AND PUDDINGS

LESSON CONTENT	CLASS ACTIVITY

f. Crepes may be made ahead of service and rewarmed, or frozen, thawed and rewarmed.

g. Fill with items such as butter creams, applesauce, marmelade, jam or jelly, sour cream or meat or vegetables, if being used as an entrée.

h. Serve dessert crepes warm, dusted with powdered sugar or an appropriate sauce.

C. Cake, Yeast and French Doughnuts

1. Cake doughnuts are made from a lean cake or rich muffin dough, yeast doughnuts from a sweet yeast dough, and French doughnuts from a rich eclair paste.

a. All are deep-fried.

b. French doughnuts are also called crullers, as are some twisted cake doughnuts.

LESSON CONTENT | CLASS ACTIVITY

   c. Cake doughnuts may be made into balls, fingers or other shapes, and yeast doughnuts into bismarks, longjohns and others.

2. Doughnut quality depends upon recipe balance (the formula), ingredients, techniques of mixing and handling the dough, frying, and subsequent handling after frying.

3. Most operations use a doughnut mix prepared from ingredients specifically designed to give a high quality product.

4. Quality still can be lost by improper measuring or poor mixing techniques.

   a. follow the directions of the manufacturer of the mix carefully

   b. do not over- or under-mix

   c. keep the temperatures of ingredients around 50°F to 60°F, to reduce the chance for gluten development and a toughening of the doughnut

LESSON CONTENT

CLASS ACTIVITY

5. Frying procedures include several important steps:

    a. When a doughnut or fritter or other product is dropped into hot fat and fried, it expands or develops.

        (1) This development is frequently called a "break."

        (2) Doughnuts need good break to reduce grease soaking.

        (3) The method of cutting and dropping the dough, the temperature of the fat, and the frying conditions can all affect break.

    b. Each kind of doughnut is fried in a slightly different manner:

        (1) cake doughnuts: 1½ to 2 minutes at 385°F to 390°F

LESSON CONTENT	CLASS ACTIVITY
(2) yeast doughnuts: 2 to 2½ minutes at 360°F to 365°F (3) French doughnuts: 2 to 2½ minutes at 365°F c. Excessive heat gives a dark doughnut with a raw interior, a tight compact grain, and low volume. Surface appearance will also be poor. d. Too low a temperature gives excessive expansion with a poor color, poor break and texture, and high fat absorption. e. The frying surface should not be crowded, allowing for expansion in cooking and turning of the doughnuts. f. Desirable fat absorption is about 3 ounces per dozen; 4 ounces or more is considered excessive.	

FOOD EVALUATION FORM

Handout #22-1

This is a general food evaluation form that can be used to judge the quality of any food category. Using a possible ten points for each quality trait listed, determine a numerical rating for each food product judged. When a trait does not apply, give it a score of 10 but circle it. An example of this might be the trait of "proper portion" if you are doing your evaluation in the kitchen prior to portioning or serving the product. This is a good form to use with cooks on a daily basis to get them to think critically of the products they make and where they can be improved.

Items Prepared and Evaluated	1	2	3			4	5	6	7	8	9	10	Total Score Possible
	General Appearance Appetizing	Proper Portion	Temperature			Flavor	Texture	Color	Consistency Std. Sizes No Lumps	Aroma	Size & Shape	Edibility Easy to Eat	
			Proper	Actual	Score								
	10	10			10	10	10	10	10	10	10	10	100

Handout #22-2

BLANC MANGE

4 oz			Desserts 22-2
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Milk Cornstarch Sugar Salt Water, cold	4½ qts 11¼ oz 1 lb, 2 oz 1/3 oz 2 cups		Heat milk. Blend cornstarch, sugar, salt and cold water, and add to hot milk, stirring constantly. Cook until cornstarch is done.
Eggs	12 oz		Beat eggs lightly. Add part of the hot mixture to eggs, then stir eggs into hot mixture. Cook for about 3 minutes.
Butter or margarine Vanilla	4 oz 1¼ Tbsp		Remove from heat; add butter or margarine. Cool slightly. Add vanilla. When cool, stir thoroughly, then spoon into glasses using a #12 scoop. Garnish with whipped cream and nuts or fruit.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M .E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #22-3

BROWNIE PUDDING

4" x 6" pieces — Desserts — 22-3

INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Flour	1 lb 12 oz		Mix dry ingredients.
Baking powder	2 oz		
Salt	1 1/3 oz		
Granulated Sugar	2 lbs 4 oz		
Cocoa	4 oz		
Milk Solids, nonfat	4 oz		
Shortening, melted	7 oz		Add water, shortening, vanilla and nuts. Mix well.
Water			
Vanilla	1 oz		
Nuts, chopped	12 oz		
Topping			
Brown sugar	2 lbs 4 oz		Pour batter into 2 pans 12x20x2-in. Blend brown sugar and cocoa and sprinkle over batter.
Cocoa	6 oz		
Water, hot			Place pans on oven door and pour hot water over topping. Bake at 350°F for 40 minutes. Cut into portion sizes. Lift cake into serving dish and spoon sauce over it.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #22-4

HONEY RICE PUDDING

½ cup		Desserts	22-4
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Rice Milk Salt Lemon Rind, grated	1 lb 8 oz 8 lbs 8 oz ½ oz 2 tsp		Cook rice, milk, salt and lemon rind in double boiler until rice is almost tender.
Eggs Honey Lemon juice	14 oz 2 lbs 8 oz 2 oz		Beat eggs slightly. Mix honey and lemon juice. Mix all with hot rice.
			Divide into 2 baking pans (10x16-x2½-in). Bake at 325°F for about 30 minutes. Served with whipped cream.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

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Handout #22-5

PEPPERMINT TAPIOCA

½ cup — Desserts — 22-5

INGREDIENTS	AMOUNT (48 servings)		PROCEDURE
Milk, scalded Peppermint Candy, crushed Tapioca, quick cooking Salt	5 qts 1 lb 12 oz 8½ oz ½ oz		Add crushed peppermint candy to scalded milk in double boiler. Add salt and tapioca, stirring until clear.
Egg Yolks, beaten	5 yolks		Add a little of hot mixture to egg yolks and mix. Then add all to hot mixture and cook for 5 minutes. Cool slightly.
Egg Whites, stiffly beaten	5 whites		Fold in stiffly beaten egg whites. Divide into 2 pans (10x16x2½-in) and chill. Cut each pan of pudding into 24 servings. Serve topped with whipped cream, garnished with crushed peppermint candy, grated chocolate or a little of each.

NOTE: To crush candy, place it in a cloth bag and crush it with a hammer or a rolling pin.

Cost Per Serving: ____________________

Total Production Time: ____________________

9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

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Handout #22-6

BAKED CUSTARD

4 oz			Desserts 22-6
INGREDIENTS	**AMOUNT (50 custards)**		**PROCEDURE**
Eggs Sugar Salt Milk, cold	20 1 lb 4 oz ½ tsp 1 qt		Beat eggs slightly. Add sugar, salt, and cold milk. Mix (low speed) only until blended.
Milk, scalded Vanilla Nutmeg	1 gal 2 Tbsp 2 tsp		Add scalded milk and vanilla. Pour into custard cups that have been arranged in baking pans or pour into baking pans. Place cups or pans in hot water. (Pour hot water around cups.) Bake. Custard is done when a knife inserted in custard comes out clean.

VARIATION

CARAMEL CUSTARD: Add 1 cup caramelized sugar slowly to scalded water and stir carefully until melted.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: West, B. B., Shugart, G. S., and Wilson, M. F. Food For Fifty, 6th Edition, 1979. John Wiley and Sons, Inc., New York, New York.

Handout #22-7a

APPLE CHEESE CRISP

<table>
<tr><td colspan="2">½ cup</td><td colspan="2">Desserts 22-7</td></tr>
<tr><td>INGREDIENTS</td><td colspan="2">AMOUNT (48 portions)</td><td>PROCEDURE</td></tr>
<tr><td>Apples, canned, sliced</td><td>2 No. 10 cans</td><td></td><td>Arrange 3 qts apples or 1 No. 10 can apples in each 12x20x2 pan.</td></tr>
<tr><td>Cinnamon</td><td>1 Tbsp</td><td></td><td>Sprinkle each pan with 1½ tsp cinnamon</td></tr>
<tr><td>Water
Lemon juice or lemon extract</td><td>1½ cups
¼ cup or
2 Tbsp</td><td></td><td>Combine water with lemon juice or extract. Add approximately 3/4 cup water and juice to each 12x20x2 pan.</td></tr>
<tr><td>Sugar
Flour, all-purpose
Butter or margarine
Salt</td><td>3 lb
1 lb
1 lb
1½ tsp</td><td></td><td>Combine sugar, flour, butter or margarine and salt in mixer. Using pastry knife, mix on #2 speed for about 2 minutes, or until mixture is crumbly.</td></tr>
<tr><td>Cheese, cheddar or process, grated</td><td>1 lb 8 oz</td><td></td><td>Add grated cheese off the machine and mix until well blended.
Spread 2 qts 2 cups crumbly cheese mixture evenly over each pan of apples.
Bake at 350°F for 30 minutes or until apples are tender and top is very light brown.</td></tr>
<tr><td colspan="4">NOTE: Do not overbake--cheese becomes hard if overbaked or if oven temperature is allowed to go above 350°F at any time.
SEE NEXT PAGE FOR PEANUT BUTTER APPLE CRISP.</td></tr>
</table>

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Handout #22-7b

PEANUT BUTTER APPLE CRISP

½ cup | Desserts | 22-7b

INGREDIENTS	AMOUNT (48 portions)		PROCEDURE
Sugar, brown, light	1 lb 8 oz		Follow directions for Apple Cheese Crisp through lemon juice or extract. Combine sugar, flour and peanut butter in mixer. Using pastry knife, mix on #2 speed for about 2 minutes or until mixture is crumbly. Spread 1 qt 2 cups crumbly peanut butter mixture evenly over each pan of apples. Bake at 350°F to 375°F for 30 minutes.
Flour, all purpose	14 oz		
Peanut butter	2 lb		

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Hardwick, G. B., and Kennedy, R. L. Fundamentals of Quantity Food Preparation: Desserts and Beverages, 1975. Cahners Publishing Company, CBI Publishers, Inc., Boston, MA.

Handout #22-8

BANANA SHORTCAKE

½ cup			Desserts 22-8
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Filling Sugar Water	3 lbs 2½ qts		Heat sugar and water to boiling point to make a syrup. Cool.
Bananas, A. P. Lemon juice	12 lbs 12 oz 14 oz		Add sliced bananas and lemon juice.
Shortcake Flour Sugar Baking powder Salt	3 lbs 12 oz 3 oz 3/4 oz		Sift together flour, sugar, baking powder and salt.
Shortening	9 oz		Work in shortening.
Milk Eggs, well-beaten	3 cups 5½ oz		Combine eggs and milk and add gradually to dough. Be careful not to overmix.
			Roll and cut with a 2½-inch biscuit cutter and bake in a hot oven, 450°F. Serve with banana filling topped with whipped cream and garnish with a marachino cherry.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #22-9

FRUIT COBBLERS

#30 scoop			Desserts 22-9
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Crust Flour Sugar Baking Powder Salt Margarine	 2 lbs 8 oz 2 oz ½ oz 12 oz		Sift dry ingredients into mixer bowl. Add shortening and mix with flat beater for 3 minutes at low speed.
Milk NOTE: Biscuits may be baked on top of fruit if preferred.	3 cups		Portion onto greased baking sheet with a #30 scoop. Brush tops with milk and sprinkle with granulated sugar. Bake at 450°F for 12 to 15 minutes until nicely browned.
Fillings Cornstarch Sugar Salt Fruit juice, cold Fruit juice, hot	 10 oz 2 lbs 8 oz 2 tsp 12 oz 2 lbs		Combine dry ingredients with cold juice and stir into hot juice. Cook until thick and clear.

INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Margarine Lemon juice	6 oz 2 oz		Remove from heat and add margarine and lemon juice.
Fruit, drained*	13 lbs		Add fruit and divide into 2 pudding pans. Top with crust.
*Fruit may be: Cherries, Berries, Peaches or Apricots.			
NOTE: 2 Tbsp cinnamon and ½ tsp nutmeg may be added if desired.			
Cost Per Serving: ____________________ Total Production Time: ____________________			9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York

Handout #22-10

ORANGE SPANISH CREAM

½ cup Desserts 22-10

INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Gelatin Milk, cold	2 oz 2 cups		Soak gelatin in cold milk for 5 to 10 minutes.
Milk, scalded Sugar Salt	1½ qts 1 lb ½ oz		Dissolve soaked gelatin in scalding milk. Add sugar and salt and dissolve.
Egg Yolks	8 oz		Beat egg yolks. Add small amount of hot liquid to egg yolks, stirring, then add yolks to hot liquid. Cook until somewhat thickened (thin).
Orange juice Lemon juice Orange rind, grated Lemon rind, grated	1 qt 1 cup $\frac{1}{3}$ oz 1 tsp		Remove from heat and add juices and rinds.
Egg Whites	2 cups		Beat egg whites until stiff and carefully fold in. Chill.
			Serve with colorful fruit sauce or garnish with slice of orange.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #22-11

BANANA CREAM DESSERT

#16 scoop			Desserts 22-11
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Water, boiling Lemon Gelatin	3 $\frac{3}{4}$ cups 7½ oz		Dissolve gelatin in boiling water.
Whipping Cream Bananas, peeled Sugar	2½ cups 3 lbs 2 oz 2 oz		Whip cream. Mash bananas and add sugar. Combine whipped cream with bananas and sugar. When gelatin begins to thicken, stir in banana-cream mixture. Chill. Serve with a #16 scoop into sherbert glasses. Garnish with sliced banana or fruit sauce such as strawberry or pineapple.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

Handout #22-12

CARAMEL SAUCE

3 oz			Desserts 22-12
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Sugar	2 lbs		Caramelize sugar (be careful not to caramelize too much; sugar burns easily).
Water Salt	1½ qt ¼ oz		Add water and salt slowly to caramelized sugar (it boils over quickly). Boil until thoroughly dissolved.
Gelatin Vanilla	1½ oz 1½ Tbsp		Soak gelatin in cold water 5 to 10 minutes. Remove syrup from heat and add soaked gelatin and vanilla.
			Volume at this point should be 2 qts. If less, add water to make that amount. Chill. When mixture thickens, add cream which has been whipped until thick and glossy, with vanilla added. Mix well. Chill.

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York.

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Handout #22-13

STRAWBERRY BAVARIAN

3 oz			Desserts 22-13
INGREDIENTS	AMOUNT (50 servings)		PROCEDURE
Strawberry Flavored Gelatin Sugar Water, boiling	13 oz 8 oz 1½ qts		Mix gelatin and sugar. Dissolve in boiling water.
			Refrigerate until mixture begins to thicken. Beat until foamy.
Whipping Cream Strawberries, crushed	1½ qts 1 qt		Fold in whipped cream and crushed strawberries. Serve with whipped cream and whole strawberries.
Cost Per Serving: ____________________ Total Production Time: ________________________			9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York

Handout #22-14

DEVIL'S FOOD PUDDING

3½ oz			Desserts 22-14
INGREDIENTS	AMOUNT (48 servings)		PROCEDURE
Sugar Milk Chocolate, grated	1 lb 1 lb 12 oz		Cook sugar, milk and chocolate together until thick. Cool thoroughly.
Butter or margarine Sugar	1 lb 2 lbs		Cream butter or margarine and sugar thoroughly.
Eggs, whole	12 oz		Beat eggs well and add to creamed mixture. Beat until fluffy. Add cooled chocolate mixture and blend well.

INGREDIENTS	AMOUNT (48 servings)		PROCEDURE
Flour, pastry	2 lbs		Sift flour and salt. Add alternately with milk (1/3 of flour and ½ of the milk at a time).
Salt	1/3 oz		
Milk	2 lbs		
Soda	4 tsp		Mix soda, water and vanilla and add last. Mix in well. Yield: 10½ lbs. Divide into 2 pans (10x16x2½-in). Steam pudding for 1 hour, or bake at 250°F for 1½ hours, covered. Cut contents of each pan into 24 portions (2½x2 3/4 x 2-inch). Serve hot with whipped cream or ice cream sauce.
Water, cold	2 oz		
Vanilla	1½ Tbsp		

Cost Per Serving: ____________________

Total Production Time: ____________________ 9/30/81

Adapted from: Terrell, M. E. Large Quantity Recipes, 1975. J. B. Lippincott Company, New York, New York

LESSON 23 : PROGRESS TEST FOR LESSONS 17, 18, 19, 20 and 21 OF QUANTITY FOOD PREPARATION

A. GOAL OF THIS LESSON

The goal of this lesson is to review the most important aspects of the past six lessons.

B. PURPOSE OF THIS LESSON

After completing this lesson, the participants should be able to:

1. summarize and review the important information presented in Lessons 17, 18, 19, 20, 21 and 22;
2. emphasize the most important points presented in Lessons 17, 18, 19, 20, 21 and 22.
3. identify subject areas in which participants desire or need further study and practice.

Note: The Progress Test should NOT scare or humiliate participants or be used as a device to keep them from continuing on with further lessons. There is no minimum score of success. This is an exercise or learning activity just as the other lessons have been.

LESSON 23 : PROGRESS TEST FOR LESSONS 17, 18, 19, 20, 21 and 22 OF QUANTITY FOOD PREPARATION

C. INSTRUCTOR PREPARATION FOR CLASS PROGRESS TEST

1. The time allowed for this lesson is approximately 25 minutes.
2. Duplicate sufficient copies of Progress Test.
3. Give the Progress Test:
   a. pass out copies of the progress test to each participant
   b. provide pens or pencils for those who may not have brought their own
   c. explain that the reason for this Progress Test is to review the important information presented in the past lessons
   d. briefly go through the test together to explain the different kinds of questions to be sure that all participants know what they need to do for each question
   e. allow approximately 25 minutes for participants to complete the test
   f. allow participants to keep their own test while answers are discussed
   g. state aloud which answer(s) are correct for each question
   h. discuss how to change false statements so they read "true "
   i. lead a class discussion relating to reasons why other choices, if given, are incorrect. Ask participants to give examples of the application of each question to their school foodservice situation
   j. allow any participants who desire to do so to retake the test on their own time
   k. provide additional references on any topic to participants who desire further information

PROGRESS TEST 5 - Quantity Food Preparation

This test covers Lessons 17, 18, 19, 20, 21 and 22. Select (check) all of the correct answers to each question. Some of the questions have more than one correct answer.

1. Identify the true statement(s) below.

______ a. Cake flour feels soft and satiny because it has been highly refined.

______ b. Gluten is plant protein found in flour.

______ c. The words "enriched" and "fortified" mean the same thing.

______ d. To substitute for one pound of cake flour, use 14 oz of all-purpose flour plus 2½ oz of cornstarch.

2. Identify the true statement(s) below.

______ a. All flours are refined.

______ b. Bleaching of flour is usually done with chemicals.

______ c. Flour enrichment standards are set by each state that processes flour.

______ d. The endosperm is the inner portion of the wheat kernel.

3. Select the main leavening agents in the products listed below with each one of the food products. Put the number on the line.

Food Products

______ sifted flour

______ popovers

______ eclairs

______ biscuits

______ hamburger buns

______ whipped egg whites

______ whole wheat bread

Leavening Agents

1. air
2. steam
3. chemicals
4. yeasts

4. Identify the true statement(s) below.

______ a. Brown sugar comes from brown sugar beets.
______ b. Brown sugar is granulated sugar with a thin molasses coating.
______ c. Emulsifiers are added to fats to give a smoother texture to baked goods.
______ d. Powdered sugar and confectioners sugar are the same thing.

5. Identify the true statement(s) below.

______ a. Use more yeast in warm weather than in cold weather.
______ b. Yeast grows best between 78° and 90°F.
______ c. Yeast is a plant that feeds on sugars.
______ d. Yeast is destroyed above 140°F.

6. Identify the true statement(s) below.

______ a. Benching a dough refers to letting it "rest."
______ b. Docking a dough refers to a process of portioning.
______ c. Fermentation and proofing refer to the same step in yeast dough preparation.
______ d. The straight dough method is the most commonly used method of yeast dough preparation.

7. Identify the true statement(s) below.

______ a. During fermentation a dough ripens.
______ b. Retarded dough is usually thought of as a refrigerated dough.
______ c. The rounding process refers to the kneading process before fermentation.
______ d. Young dough has not been fermented enough.

8. For the best proofing of a yeast dough

______ a. Set the dough on the back of a warm range.
______ b. Use 100°F to 140°F temperatures.
______ c. Use 80 to 85% humidity.
______ d. Volume of the product should double.

9. Identify the true statement(s) below.

______ a. A shred on the side of a baked loaf is a sign of high quality.
______ b. A well-baked yeast bread sounds hollow when tapped.
______ c. Bloom on a baked product is caused through a carmelization process.
______ d. Oven heat swells protein cells and coagulates the starch.

10. Identify the true statement(s) below.

______ a. Bake products stale more rapidly under refrigeration.

______ b. For extended storage, baked goods should be frozen.

______ c. Leave baked loaves and rolls in pans until completely cool, then remove.

______ d. Store French-type crisp breads and rolls in air-tight plastic bags.

11. Identify the true statement(s) below.

______ a. All quick breads are made from basically similar ingredients with variations in proportions of ingredients used, mixing and baking methods.

______ b. All quick breads use baking powder or baking soda as a leavening agent.

______ c. Muffin batter should be mixed thoroughly on medium speed for 15 to 20 minutes.

______ d. Muffin pans should be thoroughly washed between use with a high quality soap or detergent.

12. Identify the true statement(s) below.

______ a. Compact, heavy biscuits may be caused by undermixing or underkneading.

______ b. Good eclairs have a hollow, slightly moist interior.

______ c. Quality biscuits should double their height from the unbaked to baked stage.

______ d. Scones are similar to muffins.

13. Griddle cakes should be turned when:

______ a. Bubbles stop forming on the top of the cake.

______ b. Edges of cake show a slight drying.

______ c. Steam stops rising from the cake.

______ d. The top becomes dry.

14. Pie crust tenderness may be affected by the:

______ a. Amount of mixing done on the dough.

______ b. Amount of shortening in the recipe.

______ c. Brand of baking soda used.

______ d. Temperature of the oven used.

15. A high quality baked pie crust should have which of the following characteristics:
______ a. Have a rough blistery surface
______ b. Should break easily
______ c. Should crumble when cut
______ d. Should feel very oily when rubbed between the fingers.

16. Select the true statement(s) below about pie dough ingredients:
______ a. Shortening is added primarily for flavor.
______ b. Shortening serves as a lubricant for flour particles.
______ c. Salt adds flavor and strengthens the gluten in the flour.
______ d. Water furnishes steam that causes a flaky crust.

17. Gluten development is encouraged by:
______ a. High oven temperatures
______ b. Little mixing
______ c. Moisture
______ d. Vigorous mixing

18. A pie dough that shrinks excessively while baking may have:
______ a. Been baked without being double panned or filled with dry beans.
______ b. Been stretched while shaping in the pie pan.
______ c. Been too warm when rolled and formed.
______ d. Excess gluten development

19. Basic cake types include:
______ a. Angel
______ b. Butter
______ c. Foam
______ d. Pound

20. Butter cake standards include:
______ a. Fine, even grain on cut surface
______ b. Lightly blistered, golden brown crust
______ c. Slightly rounded top
______ d. Slightly split top in center

21. Basic cake mixing methods include:
______ a. Blending method
______ b. Biscuit method
______ c. Creaming method
______ d. No-knead method

22. Identify the true statement(s) below.
______ a. Black baking pans give better volume and bake products more rapidly.
______ b. Fill cake pans 3/4ths full of batter for proper volume.
______ c. Greased pan sides will reduce cake volume.
______ d. Small or thin cakes are baked at lower temperatures.

23. Identify the true statement(s) below about baking cakes.
______ a. A too-hot oven may make a cake suffer from oven collapse.
______ b. Cake texture is improved if cakes are put into preheated ovens.
______ c. Do not have cake pans touching each other or the sides of the oven during baking.
______ d. Ovens need not be level as long as cake pans are flat on the bottom.

24. The basic types of icings include:
______ a. Butter cream
______ b. Foam or marshmallow
______ c. Fondants
______ d. Glazes

25. A frosting or icing should:
______ a. Be deeply colored to attract customer's attention.
______ b. Be spread smooth by using a spatula dipped in vegetable oil.
______ c. Help preserve cake moistness.
______ d. Spread easily.

26. Cookie spread is:
______ a. Decreased by high sugar content of recipes.
______ b. Increased with leaner doughs
______ c. Reduced by using powdered sugar in recipes.
______ d. Reduced by leaner doughs.

27. Select the true statement(s) below about cookies.

______ a. Chocolate cookies burn easily.

______ b. Oven-spring is not a good test to use for cookie done-ness.

______ c. Pack and store cookies while warm to maintain freshness.

______ d. Store cookies in clean containers with loosely fitting lids for some air circulation.

ANSWER KEY

PROGRESS TEST 5 - Quantity Food Preparation

1.	a, b
2.	b, d
3.	1 3 2 2 3 4 1 4
4.	b, c
5.	b, c, d
6.	a, d
7.	a, b, d
8.	c, d
9.	b, c
10.	b
11.	a
12.	b, c
13.	b
14.	a, b
15.	a, b
16.	b, c, d
17.	c, d
18.	a, b, c, d
19.	b, c, d
20.	a, c
21.	a, c
22.	a, c
23.	b, c
24.	a, b, c, d
25.	c, d
26.	c
27.	a

APPENDIX I

INSTRUCTOR'S GUIDE FOR PIE AND PASTRY PREPARATION

1. Allow 20 to 30 minutes for participants to become familiar with the kitchen to be used, the location and operation of equipment, and the location of ingredients needed for the preparation of assigned recipes.

2. Divide participants into pairs and give each couple one of the recipes on Handouts A-1 through A-2 to prepare.

3. Ask each pair to first adjust the base recipe yield as noted on the top of the recipe. Ask them to use the Factor Method for adjusting this recipe as was described in Lesson 2 on Standardized Recipes. The adjusted recipe ingredient amount should be written in the blank colum provided on each recipe.

4. The couple making pie pastry will give their excess dough to other participants needed pie pastry. Peach streusel needs 1½ pounds of raw pastry dough and cherry pie needs 5 pounds. The remaining dough is to be used for plain pie shell variations.

5. The total number of pies to be prepared is summarized below:

Recipes to Prepare	Base Recipe Amounts	Adjusted Recipe Amounts
Pie Pastry	24	18
Peach Streusel	18	3
2 Crust Cherry	15	5
Orange Cream in Graham Shell	15	5
Lime Chiffon in Vanilla Wafer Crust	15	5
Total Pies Made		18
Total Plain Shells Made		10

6. After all products have been prepared, evaluate them using the form on Handout #20-1. Evaluations can be done by those who prepared each product or by other class participants.

7. Allow adequate time for products to be prepared, cooled and evaluated.

8. While products are cooling or chilling, clean up the kitchen facility used and set up tasting forks and small liners to use during the evaluation of the products prepared.

Handout A-2

PIE PASTRY -- SINGLE CRUST PIES

Adjust base recipe from 24 single pie shells to 18. Write adjusted recipe ingredient amounts in the blank column provided below. Read Page 2 of this handout before proceeding.

Ingredients	Amounts		Procedures
	24 shells		
Flour, pastry Lard	6 lb 2 oz 3 lb 4 oz		1. Add lard to flour in mixer bowl. 2. Using pastry blender mixer attachment, mix on Number 1 speed for 1 minute. 3. Turn to Number 2 speed and blend for ½ to 1 minute more or until lumps are the size of large dry beans. Watch carefully at this stage of preparation.
Salt Water, cold (60-65°F)	2 oz 3 $\frac{3}{4}$ oz		4. Dissolve salt in cold water. Add salted water to flour mixture on Number 1 speed for about ½ minute. 5. Turn to Number 2 speed for ¼ to ½ minute, or count to 10 slowly. When mixture forms 2 large balls, pastry is complete.
			6. Chill dough in refrigerator 10 to 15 minutes before rolling. Pastry may be cut into 8 oz amounts before being chilled.
			7. Roll crusts $^1/8$ inch thick on lightly floured area. Use pastry flour. Crusts may be rolled by hand or a pie press or dough roller may be used.

Handout A-2/Page 2

	Procedures
	8. When rolling by hand, roll pastry in a circular sheet of uniform thickness about 2 inches larger than the pie pan.
	9. Place rolled pastry in pie pan. Be sure to let crust sink into pan. DO NOT STRETCH DOUGH. Be sure there are no air pockets under dough in the pan.
	10. Trim excess dough from edge of pan.
	11. Place second pie pan inside raw pie shell (double-panning) if fluted edge is not desired. If edge is fluted, fill raw shell with dry beans or raw rice to prevent blistering and shrinking of dough during baking.
	12. Bake at 450°F for 7 minutes. Remove top pie pan, beans or rice from partially baked shells. Bake 5 minutes more or until light brown.
	13. Cool and fill as directed.

Adapted from: Fundamentals of Quantity Food Preparation: Desserts and Beverages
by Geraldine Hardwick and Robert L. Kennedy

1. When the pastry dough is completed at the end of Step 5 of the recipe, give 1½ pounds of raw pastry to the participants making peach streusel pies, and 5 pounds of pastry to those making cherry pies.

2. The remaining dough is to be used to make the plain pie shell variations described below.

3. Prepare 2 pie shells according to each of these variations. Label baked samples by letter so as not to indicate what preparation method was adjusted.

   A. Bake shells as directed on the recipe, fluting the edges (fill with beans).

   B. Take the dough and work in an excess amount of dusting flour while rolling out the dough. Bake as directed double-panned.

   C. Take dough and roll it out 4 times so as to over-develop the gluten. Bake as directed double-panned.

   D. Flute edges and bake at 350°F for 15 minutes following instructions for filling raw shell with dry beans.

   E. Double-pan and bake at 450°F for 12 minutes but do not remove top pie tin.

Handout A-3

PEACH STREUSEL PIE (Canned Pie Pack Peaches)

Adjust the base recipe from 18 pies to 3 pies. Write the adjusted recipe ingredient amounts in the blank column provided below. Get 1½ lb of pie pastry from participants assigned to make it. Roll pastry and form 3 unbaked pie shells following Steps 7 through 9 of Handout #20-3.

INGREDIENTS	Amount		Procedures
	18 pies (10 in)		
Peaches, Pie Pack, sliced, drained	6 No. 10 cans		1. DRAIN PEACHES THOROUGHLY. Put 1 qt peaches in each unbaked pie shell.
Sugar Nutmeg	3 lb 12 oz 1 Tbsp		2. Combine sugar and nutmeg. Put a heaping ½ cup of this mixture over the peaches in each pie shell.
Eggs, whole Cream, heavy	$3\frac{3}{4}$ cups (18 med.) 2½ cups		3. Combine eggs and cream. Mix enough to combine. Put $^1/3$ cup egg/cream mixture over each pie.
Brown Sugar, light Flour, all purpose Butter or margarine	1 lb 8 oz 2 lb 4 oz 2 lb 4 oz		4. Using a pastry blender, combine brown sugar, flour and butter or margarine until crumbly. Put 1½ cups of this mixture in each pie.
			5. Bake at 425°F for 30 minutes or until light brown on top. Cool and portion.
			6. Cut each pie into 8 wedges.

Adapted from: Fundamentals of Quantity Food Preparation: Desserts and Beverages, by Geraldine Hardwick and Robert L. Kennedy.

Handout A-4

2-CRUST RED CHERRY PIES (Canned Cherries)

Adjust base recipe from 15 pies to 5 pies. Write the adjusted recipe ingredient amounts in the blank column provided below. Get 5 pounds of pie pastry from the participants assigned to make it. Roll pastry and form 5 unbaked pie shells following Steps 7 through 9 of Handout #20-3, page 1.

Ingredients	Amount		Procedure
	15 pies (10")		
Cherries, RSP,* canned, drained Cherry juice and Water, Hot	3 No. 10 cns 1 gal 2 cups		1. DRAIN CHERRIES WELL. Heat first amount of juice and water. Use enough water to make up the amount required.
Sugar	6 lb		2. Add sugar to hot juice and bring back to a boil.
Cornstarch Salt Cherry juice and Water, Cold	1 lb 2 oz $^3/4$ tsp 1 qt 2 c		3. Add cornstarch and salt to cold cherry juice and water. Stir until cornstarch is dissolved.
			4. Add dissolved cornstarch mixture to hot juice and cook for 5 minutes or until thickened and cornstarch flavor has disappeared. Remove from heat.

*Red, Sour, Pitted

Ingredients	Amount		Procedure
	15 pies (10")		
Lemon rind, grated Food coloring, red	3 Tbsp 1 Tbsp		5. Add lemon rind, red color and cherries to thickened mixture. Stir to mix.
			6. Pour 1 qt cherry mixture into each unbaked 10-inch pie shell. 7. Cover with top crust.
			8. Bake at 375°F for 40 minutes.
			9. Cool and portion. Cut each pie into 8 wedges.

Adapted from: Fundamentals of Quantity Food Preparation: Desserts and Beverages, by Geraldine Hardwick and Robert L. Kennedy.

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APPENDIX II

HANDOUT #2-7

RECIPE SOURCES

The Following Is A Mailing List of Companies Offering Quantity Recipes at No Cost, or At a Reduced Price:

1. American Dry Milk
   130 North Franklin Street
   Chicago, IL 60606
   (312) 782-4888

   Pamphlets, posters and recipe cards on the use of nonfat dry milk in home and quantity cooking.

   Materials for orders of 25 or less are issued free, and charges are nominal for larger orders. Publications are $0.10 - 0.25 each, except for "Quantity Recipe Cards (100 servings or more)", which is $1.25 each.

2. Blue Goose, Inc.
   Educational Dept.
   P.O. Box 1118
   Hagerstown, MD 21740

   Publishes "The Buying Guide for Fresh Fruits, Vegetables, Herbs and Nuts," which supplies information on the buying, storing, use and nutritional value of these foods. Used as a training manual for produce clerks, and it is written at the consumer level.

   For 40 copies of more - $3.50 each. Fewer copies @ $4.00 each.

3. California Raisin Advisory Board
   P.O. Box 5335
   Fresno, CA 93755

   21 quantity recipe cards using raisins (24 servings) in salads, sandwiches and sauces,

plus a card with nutritional information, use and storage of raisins. Also, 5 quantity recipe cards using raisins (100 servings) in desserts, aimed at pleasing children.

These are both available at no cost.

4.' Campbell's Soup Company
Home Economics Dept.
Food and Nutrition Services
Campbell Place
Camden, NJ 08101
(609) 964-4000

Four sets of recipe cards available using Campbell soups:

1. "Campbell's A+ Lunches" - 14 recipe cards of entrees in 100 portions aimed at children. Suggests serving menu.

2. •50 standard quantity recipes of entrees with meats, fish and eggs in 25 portions (most).

3. 12 quantity recipes for sauces in 2 quart amounts. Some suggest variations.

4. 4 quantity recipes for vegetable dishes in 25 portions sizes.

Each set is available at no cost.

5. CBI Publishing Co., Inc.
51 Sleeper Street
Boston, MA 02210
(617) 426-2224

Publishes book: "Contemporary Quantity Recipe File" @$23.50.

6. Florida Celery Advisory Committee
   P.O. Box 20067
   441 East Colonial Drive
   Orlando, FL 32814

   Offers 5 quantity recipe cards using celery as a side dish. Each recipe serves 50 portions.

   Available free of cost.

7. Florida Department of Citrus
   Lakeland, FL

   Two sets of quantity recipe cards using citrus fruits.

   1. 12 cards in 100 portion sizes is aimed at School Foodservice. Includes entrees, sauces, beverages and desserts.

   2. Prize-winning citrus recipes written in a more standard home cookbook manner in 25-50 portion dishes.

   Both sets are available free of charge.

8. Kelloggs Sales Company
   Foodservice Marketing
   Battle Creek, MI 49106

   12 quantity recipe cards using Kelloggs' cereals in entrees, vegetables and desserts. Serving sizes vary between 24 and 96, with directions given for 2 quantities per card.

   Available free of charge.

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9. Kraft Consumer Service
Consumer Education
Glenview, IL 60025

Offers pamphlets covering topics of consumer interest, information sheets on Kraft products (history, use and selection) and posters (approx. 11 x 16") showing food preparation ideas.

Up to 25 copies are available free of charge.

10. National Restaurant Association
211 First Street, NW
Washington, DC 20001

Publishes a large number of foodservice books and audio-visuals covering all facets of foodservice management and preparation.

The catalog describing each publication is free.

11. North Carolina Yam Commission, Inc.
P.O. Box 12005
505 Oberlin Road
Raleigh, NC 27605

Offers one menu planning card on the use of yams in cooking, including information on their nutritional value.

Available free of charge.

12. Rice Council of America
P.O. Box 22802
Houston, TX 77027

Three sets of quantity recipe cards using rice are available:

1. "Rice Recipes for Food Service" - 6 recipes for 50 portions for entrees and side dishes.

2. "Rice Goes to School" - 8 recipes for 100 portions, including menu suggestions, for entrees and side dishes aimed at pleasing children.

3. "Profit-Making, Labor-Saving Rice Recipes" 6 recipes for 50 portions for entrees and side dishes, each including the per-serving calorie and macro-nutrient breakdown.

All available free of charge.

13. Sun-Diamond Growers of California
1050 South Diamond Street
P.O. Box 1727
Stockton, CA 95201

Spiral-bound recipe book available of 37 quantity recipes featuring walnuts in baked goods, especially sweet breads and desserts.

Available free of charge.

14. Sunkist Growers, Inc.
P.O. Box 7888
Van Nuys, CA 91409

Provides educational materials on the selection and use of citrus fruits.

HANDOUT #2-7

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1. "Sunkist Lemon-Aid Kit"-includes a grater, juicer, fruit juice "faucet", 2 fruit peelers and a recipe booklet on lemons.

2. "Pizazz" package-educational package aimed at training foodservice workers on merchandising food using citrus garnishes. Includes a set of slides and script, booklet on garnishing, citrus buying guide, and quantity recipes.

3. "Sunkist Foodservice Handbook"-a buying guide for buying and storing fresh citrus.

The "Lemon Aid Kit" is available @ $3.00, with individual items available separately. The "Pizazz" package costs $8.50. The Foodservice Handbook is free of charge.

15. U.S. Government Printing Office
Superintendent of Documents
Washington, DC 20402

Provides cookbooks and recipes on a wide variety of subjects in special areas (i.e. apples, cereals), most geared to household use. Also publishes "Recipes for Quantity Service"-151 cards with colored index tabs.

Most publications cost $1.50-3.00. Recipe cards available @ $9.35/set.

APPENDIX

DIRECT READING MEASUREMENT TABLES

Adapted from: Standardized Recipes for Institutional Use. By Pearl J. Aldrich and Grace A. Miller, Agric. Expt. Sta., Michigan State U., 1963, pages 20-23.

Instructions for Using Table 1 Which Follows:

1. Locate column which corresponds to the original yield of the recipe you wish to adjust. For example, let us assume your original recipe for meat loaf yields 100 portions. Locate the 100 column.
2. Run your finger down this column until you come to the amount of the ingredient required (or closest to this figure) in the recipe you wish to adjust. Say that your original recipe for 100 portions of meat loaf requires 21 pounds of ground beef. Run your finger down the column headed 100 until you come to 21 pounds.
3. Next, run your finger across the page, in line with that amount, until you come to the column which is headed to correspond with the yield you desire. Suppose you want to make 75 portions of meat loaf. Starting with your finger under the 21 lb. (in the 100 column), slide it across to the column headed 75 and read the figure. You see you need 15 lb. 12 oz. ground beef to make 75 portions with your recipe.
4. Record this figure as the amount of the ingredient required for the new yield of your recipe. Repeat Steps 1,2,3 for each ingredient in your original recipe to obtain the adjusted ingredient weight needed of each for your new yield. You can increase or decrease yield in this manner.
5. If you need to combine two columns to obtain your desired yield, follow the above procedure and add together the amounts given in the two columns to get the amount required for your adjusted yield. For example, to find the amount of ground beef for 225 portions of meat loaf (using the same basic recipe for 100 we used above) locate the figures in columns headed 200 and 25 and add them. In this case they would be: 42 lb. + 5 lb. 4 oz., and the required total would be 47 lb. 4 oz.
6. The figures in Table 1 are given in exact weights including fractional ounces. After you have made yield adjustments for every ingredient, refer to Table 4 for "rounding-off" fractional amounts which are not of sufficient proportion to change product quality. No "rounding-off" is required for amounts needed for adjusted ingredients in the examples we have used here.

TABLE 1. Direct-reading table for adjusting yield of recipes with ingredient amounts given in weights. (This table is primarily for adjusting recipes with original and desired portion yields which can be divided by 25. It may be used along with Table 2 which is similarly constructed for measures)

ABBREVIATIONS IN TABLE:
oz. = ounce
# = pound

BASIC INFORMATION:
1 pound = 16 ounces

25	50	75	100	200	300	400	500	600	700	800	900	1000
*	*	*	¼ oz.	½ oz.	3/4 oz.	1 oz.	1¼ oz.	1½ oz.	1-3/4 oz	2 oz.	2¼ oz.	2½ oz.
*	*	*	½ oz.	1 oz.	1½ oz.	2 oz.	2½ oz.	3 oz.	3½ oz	4 oz.	4½ oz.	5 oz.
*	*	*	3/4 oz.	1½ oz.	2¼ oz.	3 oz.	3¾ oz.	4½ oz.	5¼ oz	6 oz.	6-3/4 oz.	7½ oz.
¼ oz.	½ oz.	3/4 oz.	1 oz.	2 oz.	3 oz.	4 oz.	5 oz.	6 oz.	7 oz	8 oz.	9 oz.	10 oz.
*	*	*	1¼ oz.	2½ oz.	3¾ oz.	5 oz.	6¼ oz.	7½ oz.	8-3/4 oz	10 oz.	11¼ oz.	12½ oz.
*	3/4 oz.	*	1½ oz.	3 oz.	4½ oz.	6 oz.	7½ oz.	9 oz.	10½ oz	12 oz.	13½ oz.	15 oz.
*	*	*	1¾ oz.	3½ oz.	5¼ oz.	7 oz.	8¾ oz.	10½ oz.	12¼ oz	14 oz.	15¾ oz.	1# 1½ oz.
½ oz.	1 oz.	1½ oz.	2 oz.	4 oz.	6 oz.	8 oz.	10 oz.	12 oz.	14 oz	1#	1# 2 oz.	1# 4 oz.
*	*	1¾ oz.	2¼ oz.	4½ oz.	6¾ oz.	9 oz.	11¼ oz.	13½ oz.	15¾ oz	1# 2 oz.	1# 4¼ oz.	1# 6½ oz.
*	1¼ oz.	2 oz.	2½ oz.	5 oz.	7½ oz.	10 oz.	12½ oz.	15 oz.	1# 1½ oz	1# 4 oz.	1# 6½ oz.	1# 9 oz.
*	*	2 oz.	2¾	5½ oz.	8¼ oz.	11 oz.	13¾oz.	1# ½ oz.	1# 3¼ oz	1# 6 oz.	1# 8¾oz.	1# 11½ oz.
¾ oz.	1½ oz.	2¼ oz.	3 oz.	6 oz.	9 oz.	12 oz.	15 oz.	1# 2 oz.	1# 5 oz	1# 8 oz.	1# 11 oz.	1# 14 oz.
*	*	2½ oz.	3¼ oz.	6½ oz.	9¾oz.	13 oz.	1# ¼ oz.	1# 3½ oz.	1#6¾ oz	1# 10oz.	1# 13¼oz.	2# ½ oz.
*	1¾ oz.	2⅝ oz.	3½ oz.	7 oz.	10½ oz.	14 oz.	1#1½ oz.	1# 5 oz.	1#8½ oz	1# 12oz.	1# 15½oz.	2# 3 oz.
1 oz.	2 oz.	2¾ oz.	3¾ oz.	7½ oz.	11¼ oz.	15 oz.	1#2¾ oz.	1# 6½ oz.	1#10¼ oz	1# 14 oz.	2# 1¾oz.	2# 5½ oz.
1 oz.	2 oz.	3 oz.	4 oz.	8 oz.	12 oz.	1#	1# 4 oz.	1# 8 oz.	1# 12 oz	2#	2# 4 oz.	2# 8 oz.
1 oz.	2¼ oz.	3¼ oz.	4¼ oz.	8½ oz.	12¾oz.	1# 1 oz.	1# 5¼ oz.	1# 9½ oz.	1# 13¾oz	2# 2 oz.	2# 6¼oz.	2# 10½oz.
*	2¼ oz.	3½ oz.	4½ oz.	9 oz.	13½ oz.	1# 2 oz.	1# 6½ oz.	1# 11 oz.	1# 15½ oz	2# 4 oz.	2# 8½oz.	2# 13 oz.
*	2½ oz.	3½ oz.	4¾ oz.	9½ oz.	14¼ oz.	1# 3 oz.	1# 7¾oz.	1# 12½oz.	2# 1¼ oz	2# 6 oz.	2# 10¾oz.	2# 15½oz.
1¼ oz.	2½ oz.	3¾oz.	5 oz.	10 oz.	15 oz.	1# 4 oz.	1# 9 oz.	1# 14 oz.	2# 3 oz	2# 8 oz.	2# 13 oz.	3# 2 oz.
*	2¾ oz.	4¼ oz.	5½ oz.	11 oz.	1# ½ oz.	1# 6 oz.	1# 11½oz.	2# 1 oz.	2# 6½ oz	2# 12 oz.	3# 1½ oz.	3# 7 oz.
1½ oz.	3 oz.	4½ oz.	6 oz.	12 oz.	1# 2 oz.	1# 8 oz.	1# 14 oz.	2# 4 oz.	2# 10 oz	3#	3# 6 oz.	3# 12 oz.
*	3¼ oz.	4¾oz.	6½ oz.	13 oz.	1# 3½ oz.	1# 10 oz.	2# ½ oz.	2# 7 oz.	2# 13½ oz	3# 4 oz.	3# 10½ oz.	4# 1 oz.
1¾ oz.	3½ oz.	5¼ oz.	7 oz.	14 oz.	1# 5 oz.	1# 12 oz.	2# 3 oz.	2# 10 oz.	3# 1 oz	3# 8 oz.	3# 15 oz.	4# 6 oz.
2 oz.	3¾ oz.	5¾oz.	7½ oz.	15 oz.	1# 6½ oz.	1# 14 oz.	2# 5½ oz.	2# 13 oz.	3# 4½ oz	3# 12 oz.	4# 3½ oz.	4# 11 oz.
2 oz.	4 oz.	6 oz.	8 oz.	1#	1# 8 oz.	2#	2# 8 oz.	3#	3# 8 oz	4#	4# 8 oz.	5#
2¼ oz.	4¼ oz.	6½ oz.	8½ oz.	1# 1 oz.	1# 9½ oz.	2# 2 oz.	2# 10½oz.	3# 3 oz.	3# 11½oz	4# 4 oz.	4# 12½ oz.	5# 5 oz.
2¼ oz.	4½ oz.	6¾ oz.	9 oz.	1# 2 oz.	1# 11 oz.	2# 4 oz.	2# 13 oz.	3# 6 oz.	3# 15 oz	4# 8 oz.	5# 1 oz.	5# 10 oz.
2½ oz.	4¾ oz.	7¼ oz.	9½ oz.	1# 3 oz.	1# 12½ oz.	2# 6 oz.	2# 15½oz.	3# 9 oz.	4# 2½oz	4# 12 oz.	5# 5½ oz.	5# 15 oz.
2½ oz.	5 oz.	7½ oz.	10 oz.	1# 4 oz.	1# 14 oz.	2# 8 oz.	3# 2 oz.	3# 12 oz.	4# 6 oz	5#	5# 10 oz.	6# 4 oz.
2¾ oz.	5½ oz.	8¼ oz.	11 oz.	1# 6 oz.	2# 1 oz.	2# 12 oz.	3# 7 oz.	4# 2 oz.	4# 13 oz	5# 8 oz.	6# 3 oz.	6# 14 oz.

*The amounts cannot be weighed accurately without introducing errors. Change to measurement by using conversion table as suggested in bulletin.

TABLE 1 - continued
Page 2

25	50	75	100	200	300	400	500	600	700	800	900	1000
3 oz.	6 oz.	9 oz.	12 oz.	1# 8 oz.	2# 4 oz.	3#	3# 12 oz.	4# 8 oz.	5# 4 oz.	6#	6# 12 oz.	7# 8 oz.
3¼ oz.	6½ oz.	9¾ oz.	13 oz.	1# 10 oz.	2# 7 oz.	3# 4 oz.	4# 1 oz.	4# 14 oz.	5# 11 oz.	6# 8 oz.	7# 5 oz.	8# 2 oz.
3½ oz.	7 oz.	10½ oz.	14 oz.	1# 12 oz.	2# 10 oz.	3# 8 oz.	4# 6 oz.	5# 4 oz.	6# 2 oz.	7#	7# 14 oz.	8# 12 oz.
3¾ oz.	7½ oz.	11¼ oz.	15 oz.	1# 14 oz.	2# 13 oz.	3# 12 oz.	4# 11 oz.	5# 10 oz.	6# 9 oz.	7# 8 oz.	8# 7 oz.	9# 6 oz.
4 oz.	8 oz.	12 oz.	1#	2#	3#	4#	5#	6#	7#	8#	9#	10#
4½ oz.	9 oz.	13½ oz.	1# 2 oz.	2# 4 oz.	3# 6 oz.	4# 8 oz.	5# 10 oz.	6# 12 oz.	7# 14 oz.	9#	10# 2 oz.	11# 4 oz.
5 oz.	10 oz.	15 oz.	1# 4 oz.	2# 8 oz.	3# 12 oz.	5#	6# 4 oz.	7# 8 oz.	8# 12 oz.	10#	11# 4 oz.	12# 8 oz.
5½ oz.	11 oz.	1# ½ oz.	1# 6 oz.	2# 12 oz.	4# 2 oz.	5# 8 oz.	6# 14 oz.	8# 4 oz.	9# 10 oz.	11#	12# 6 oz.	13# 12 oz.
6 oz.	12 oz.	1# 2 oz.	1# 8 oz.	3#	4# 8 oz.	6#	7# 8 oz.	9#	10# 8 oz.	12#	13# 8 oz.	15#
6½ oz.	13 oz.	1# 3½ oz.	1# 10 oz.	3# 4 oz.	4# 14 oz.	6# 8 oz.	8# 2 oz.	9# 12 oz.	11# 6 oz.	13#	14# 6 oz.	15# 12 oz.
7 oz.	14 oz.	1# 5 oz.	1# 12 oz.	3# 8 oz.	5# 4 oz.	7#	8# 12 oz.	10# 8 oz.	12# 4 oz.	14#	15# 12 oz.	17# 8 oz.
7½ oz.	15 oz.	1# 6½ oz.	1# 14 oz.	3# 12 oz.	5# 10 oz.	7# 8 oz.	9# 6 oz.	11# 4 oz.	13# 2 oz.	15#	16# 14 oz.	18# 12 oz.
8 oz.	1#	1# 8 oz.	2#	4#	6#	8#	10#	12#	14#	16#	18#	20#
8½ oz.	1# 1 oz.	1# 9½ oz.	2# 2 oz.	4# 4 oz.	6# 6 oz.	8# 8 oz.	10# 10 oz.	12# 12 oz.	14# 14 oz.	17#	19# 2 oz.	21# 4 oz.
9 oz.	1# 2 oz.	1# 11 oz.	2# 4 oz.	4# 8 oz.	6# 12 oz.	9#	11# 4 oz.	13# 8 oz.	15# 12 oz.	18#	20# 4 oz.	22# 8 oz.
9½ oz.	1# 3 oz.	1# 12½ oz.	2# 6 oz.	4# 12 oz.	7# 2 oz.	9# 8 oz.	11# 14 oz.	14# 4 oz.	16# 10 oz.	19#	21# 6 oz.	23# 12 oz.
10 oz.	1# 4 oz.	1# 14 oz.	2# 8 oz.	5#	7# 8 oz.	10#	12# 8 oz.	15#	17# 8 oz.	20#	22# 8 oz.	25#
11 oz.	1# 6 oz.	2# 1 oz.	2# 12 oz.	5# 8 oz.	8# 4 oz.	11#	13# 12 oz.	16# 8 oz.	19# 4 oz.	22#	24# 12 oz.	27# 8 oz.
12 oz.	1# 8 oz.	2# 4 oz.	3#	6#	9#	12#	15#	18#	21#	24#	27#	30#
13 oz.	1#10 oz.	2# 7 oz.	3# 4 oz.	6# 8 oz.	9# 12 oz.	13#	16# 4 oz.	19# 8 oz.	22# 12 oz.	26#	29# 4 oz.	32# 8 oz.
14 oz.	1#12 oz.	2# 10 oz.	3# 8 oz.	7#	10# 8 oz.	14#	17# 8 oz.	21#	24# 8 oz.	28#	31# 8 oz.	35#
15 oz.	1#14 oz.	2# 13 oz.	3# 12 oz.	7# 8 oz.	11# 4 oz.	15#	18# 12 oz.	22# 8 oz.	26# 4 oz.	30#	33# 12 oz.	37# 8 oz.
1#	2#	3#	4#	8#	12#	16#	20#	24#	28#	32#	36#	40#
1# 1 oz.	2# 2 oz.	3# 3 oz.	4# 4 oz.	8# 8 oz.	12# 12 oz.	17#	21# 4 oz.	25# 8 oz.	29# 12 oz.	34#	38# 4 oz.	42# 8 oz.
1# 2 oz.	2# 4 oz.	3# 6 oz.	4# 8 oz.	9#	13# 8 oz.	18#	22# 8 oz.	27#	31# 8 oz.	36#	40# 8 oz.	45#
1# 3 oz.	2# 6 oz.	3# 9 oz.	4# 12 oz.	9# 8 oz.	14# 4 oz.	19#	23# 12 oz.	28# 8 oz.	33# 4 oz.	38#	42# 12 oz.	47# 8 oz.
1# 4 oz.	2# 8 oz.	3# 12 oz.	5#	10#	15#	20#	25#	30#	35#	40#	45#	50#
1# 5 oz.	2#10 oz.	3# 15 oz.	5# 4 oz.	10# 8 oz.	15# 12 oz.	21#	26# 4 oz.	31# 8 oz.	36# 12 oz.	42#	47# 4 oz.	52# 8 oz.
1# 6 oz.	2#12 oz.	4# 2 oz.	5# 8 oz.	11#	16# 8 oz.	22#	27# 8 oz.	33#	38# 8 oz.	44#	49# 8 oz.	55#
1# 7 oz.	2#14 oz.	4# 5 oz.	5# 12 oz.	11# 8 oz.	17# 4 oz.	23#	28# 12 oz.	34# 8 oz.	40# 4 oz.	46#	51# 12 oz.	57# 8 oz.
1# 8 oz.	3#	4# 8 oz.	6#	12#	18#	24#	30#	36#	42#	48#	54#	60#
1# 10 oz.	3# 4 oz.	4# 14 oz.	6# 8 oz.	13#	19# 8 oz.	26#	32# 8 oz.	39#	45# 8 oz.	52#	58# 8 oz.	65#
1# 12 oz.	3# 8 oz.	5# 4 oz.	7#	14#	21#	28#	35#	42#	49#	56#	63#	70#
1# 14 oz.	3#12 oz.	5# 10 oz.	7# 8 oz.	15#	22# 8 oz.	30#	37# 8 oz.	45#	52# 8 oz.	60#	67# 8 oz.	75#
2#	4#	6#	8#	16#	24#	32#	40#	48#	56#	64#	72#	80#
2# 2 oz.	4# 4 oz.	6# 6 oz.	8# 8 oz.	17#	25# 8 oz.	34#	42# 8 oz.	51#	59# 8 oz.	68#	76# 8 oz.	85#
2# 4 oz.	4# 8 oz.	6# 12 oz.	9#	18#	27#	36#	45#	54#	63#	72#	81#	90#
2# 6 oz.	4#12 oz.	7# 2 oz.	9# 8 oz.	19#	28# 8 oz.	38#	47# 8 oz.	57#	66# 8 oz.	76#	85# 8 oz.	95#

TABLE 1 - continued
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25	50	75	100	200	300	400	500	600	700	800	900	1000
2# 8 oz.	5#	7# 8 oz.	10#	20#	30#	40#	50#	60#	70#	80#	90#	100#
2# 12 oz.	5# 8 oz.	8# 4 oz.	11#	22#	33#	44#	55#	66#	77#	88#	99#	110#
3#	6#	9#	12#	24#	36#	48#	60#	72#	84#	96#	108#	120#
3# 4 oz.	6# 8 oz.	9# 12 oz.	13#	26#	39#	52#	65#	78#	91#	104#	117#	130#
3# 8 oz.	7#	10# 8 oz.	14#	28#	42#	56#	70#	84#	98#	112#	126#	140#
3# 12 oz.	7# 8 oz.	11# 4 oz.	15#	30#	45#	60#	75#	90#	105#	120#	135#	150#
4#	8#	12#	16#	32#	48#	64#	80#	96#	112#	128#	144#	160#
4# 4 oz.	8# 8 oz.	12# 12 oz.	17#	34#	51#	68#	85#	102#	119#	136#	153#	170#
4# 8 oz.	9#	13# 8 oz.	18#	36#	54#	72#	90#	108#	126#	144#	162#	180#
4# 12 oz.	9# 8 oz.	14# 2 oz.	19#	38#	57#	76#	95#	114#	133#	152#	171#	190#
5#	10#	15#	20#	40#	60#	80#	100#	120#	140#	160#	180#	200#
5# 4 oz.	10# 8 oz.	15# 12 oz.	21#	42#	63#	84#	105#	126#	147#	168#	189#	210#
5# 8 oz.	11#	16# 8 oz.	22#	44#	66#	88#	110#	132#	154#	176#	198#	220#
5# 12 oz.	11# 8 oz.	17# 8 oz.	23#	46#	69#	92#	115#	138#	161#	184#	207#	230#
6#	12#	18#	24#	48#	72#	96#	120#	144#	168#	192#	216#	240#
6# 4 oz.	12# 8 oz.	18# 12 oz.	25#	50#	75#	100#	125#	150#	175#	200#	225#	250#
7# 8 oz.	15#	22# 8 oz.	30#	60#	90#	120#	150#	180#	210#	240#	270#	300#
8# 12 oz.	17# 8 oz.	26# 4 oz.	35#	70#	105#	140#	175#	210#	245#	280#	315#	350#
10#	20#	30#	40#	80#	120#	160#	200#	240#	280#	320#	360#	400#
11# 4 oz.	22# 8 oz.	33# 12 oz.	45#	90#	135#	180#	225#	270#	315#	360#	405#	450#
12# 8 oz.	25#	37# 8 oz.	50#	100#	150#	200#	250#	300#	350#	400#	450#	500#

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Instructions for Using Table 2 Which Follows:

1. Locate column which corresponds to the original yield of the recipe you wish to adjust. For example, let us assume your original sour cream cookie recipe yields 300 cookies. Locate the 300 column.
2. Run your finger down this column until you come to the amount of the ingredient required (or closest to this figure) in the recipe you wish to adjust. Say that your original recipe for 300 cookies required 2¼ c. fat. Run your finger down the column headed 300 until you come to 2¼ c.
3. Next, run your finger across the page, in line with that amount, until you come to the column which is headed to correspond with the yield you desire. Suppose you want to make 75 cookies. Starting with your finger under the 2¼ c. (in the 300 column), slide it across to the column headed 75 and read the figure. You see you need ½ c. + 1T. fat to make 75 cookies from your recipe.
4. Record this figure as the amount of the ingredient required for the new yield of your recipe. Repeat Steps 1, 2, 3 for each ingredient in your original recipe to obtain the adjusted measure needed of each for your new yield. You can increase or decrease yield in this manner.
5. If you need to combine two columns to obtain your desired yield, follow the above procedure and add together the amounts given in the two columns to get the amount required for your adjusted yield. For example, to find the amount of fat needed to make 550 cookies (using the same basic recipe as above) locate the figures in columns headed 500 and 50 and add them. In this case they would be 3¾ c. + 6 T. and the required total would be 1 qt. + 2 T. fat.
6. The figures in Table 2 are given in measurements which provide absolute accuracy. After you have made yield adjustments for each ingredient, refer to Table 4 for "rounding-off" odd fractions and complicated measurements. You can safely "round-off" to 1 qt. as shown in Table 4, for the amount of fat needed in the recipe for 550 cookies.

TABLE 2 - Direct-reading table for adjusting yield of recipes with ingredient amounts given in measurement. (This table is primarily for adjusting recipes with original and desired portion yields which can be divided by 25. It is intended for use along with Table 1 which is similarly constructed for adjusting weights)

ABBREVIATIONS IN TABLE:

t. = teaspoon
T. = Tablespoon
c. = cup
qt. = quart
gal. = gallon
(r) = slightly rounded
(s) = scant

BASIC INFORMATION

Measuring spoons
1T.
1t.
½ t.
¼ t.
for ¾ t. combine ½ t. + ¼ t.
for ⅛ t. use half of the ¼ t.

3 t. = 1 T.
4T. = ¼ c.
5T.+ 1 t. = ⅓ c.
8T. = ½ c.
10T.+ 2 t. = ⅔ c.

12 T. = ¾ c.
16 T. = 1 c.
4 c. = 1 qt.
4 qt.= 1 gal.

Measurement needed for number of portions indicated below

25	50	75	100	200	300	400	500	600	700	800	900	1000
¼ t. ½ t.(r) ¼ t.+⅛ t. ½ t.(s)	½ t. ½ t.(r) ¾ t. ¾ t.(r)	¾ t. 1t. (s) 1t.+ ⅛ t. 1¼ t.(r)	1 t. 1¼ t. 1½ t. 1¾ t.	2 t. 2½ t. 1 T. 1T + ½ t.	1 T. 1T.+ ¾ t. 1½ T. 1T.+ 2¼ t.	1T.+ 1 t. 1T.+ 2 t. 2T. 2T.+ 1 t.	1T.+ 2t. 2T.+ ¼t. 2½ T. 2T.+ 2¾ t.	2T. 2½ T. 3T. 3½T.	2T.+ 1 t. 2T.+ 2¾ t. 3½ T. 4T.+ ¼ t.	2T.+ 2 t. 3T.+ 1 t. 4T. 4T.+ 2 t.	3T. 3T.+ 2¼ t. 4T.+ 1½ t. 5T.+ ¾ t.	3T.+ 1 t. 4T.+ ½ t. 5T. 5T.+ 2½t.
½ t. ½ t.(r) ½ t.+⅛ t.	1 t. 1 t.+ ⅛ t. 1¼ t.	1½ t. 1¾ t.(s) 2 t. (s)	2 t. 2¼ t. 2½ t.	1T.+ 1 t. 1½ T. 1T.+ 2 t.	2T. 2T.+ ¾ t. 2½ T.	2T.+ 2 t. 3T. 3T.+ 1 t.	3T.+ 1 t. 3T.+2¼ t. 4T.+ ½ t.	4T. 4½ T. 5T.	4T.+ 2 t. 5T.+ ¾ t. 5½T.	5T.+ 1 t. 6T. 6T.+ 2¼ t.	6T. 6T.+ 2¼ t. 7½ T.	6T.+ 2 t. 7½ T. 8T.+ 1 t.
¾ t.(s)	1¼ t. +⅛ t.	2 t.(r)	2¾ t.	1T. + 2½ t.	2T. + 2¼ t.	3T.+ 2 t.	4T. + 1¾ t.	5½ T.	6 T. + 1¼ t.	7T.+ 1 t.	8T. + ¾ t.	9T. + ½ t.
¾ t.	1½ t.	2¼ t.	1T.	2T.	3T.	¼ c.	5T.	6T.	7T.	½ c.	½ c.+ 1T.	½ c.+ 2T.
1 t.+⅛ t.	2¼ t.	1T.+ ¼ t. + ⅛ t.	1½ T.	3T.	¼ c.+ 1½ t.	⅓ c.+ 2 t.	¼ c. + 3½ T.	½ c.+ 1 T.	½ c. + 2½ T.	¾ c.	¾ c. + 1½ T.	¾c.+ 3T.
1½ t.	1T.	1½ T.	2T.	¼ c.	¼ c.+ 2 T.	½ c.	½ c.+ 2 T.	¾ c.	¾ c.+ 2 T.	1 c.	1 c.+ 2 T.	1¼ c.
1¾t.+⅛ t.	1T.+ ¾ t.	1T.+ 2½ t. + ⅛ t.	2½ T.	¼ c.+ 1 T.	¼ c. + 3½T.	½ c.+ 2 T.	¾c.+ ½ T.	¾ c.+ 3 T.	1 c.+ 1½ T.	1¼ c.	1¼ c. + 2½ T.	1½ c.+ 1 T.
2¼ t.	1½ T.	2T.+ ¾ t.	3 T.	⅓ c.+ 2t.	½ c.+ 1 T.	¾ c.	¾c.+ 3 T.	1 c.+ 2 T.	1¼ c.+ 1 T.	1½ c.	1½ c.+ 3 T.	1¾c.+ 2T.
2¼ t. +⅛t.	1 T. + 2¼ t.	2T.+ 1½ t. + ⅛ t	3½ T.	¼ c.+ 3 T.	½ c.+ 2½T.	¾ c.+ 2T.	1 c.+ 1½T.	1¼c.+ 1 T.	1½ c. + ½ T.	1¾ c.	1¾c. + 3½ T.	2 c.+ 3 T.
1 T. 1T.+ 1 t. 2 T.	2 T. 2T.+ 2 t. ¼ c.	3 T. ¼ c. ¼ c.+ 2 T.	¼ c. ⅓ c. ½ c.	½ c. ⅔ c. 1 c.	¾ c. 1 c. 1½ c.	1 c. 1⅓ c. 2 c.	1¼ c. 1⅔ c. 2½ c.	1½ c. 2 c. 3 c.	1¾ c. 2⅓ c. 3½ c.	2 c. 2⅔ c. 1 qt.	2¼ c. 3 c. 1 qt.+ ½ c.	2½ c. 3⅓ c. 1¼ qt.
2 T.+ 2 t.	⅓ c.	½ c.	⅔ c.	1 ⅓ c.	2 c.	2⅔ c.	3⅓ c.	1 qt.	1 qt.+⅔ c.	1¼qt. + ⅓ c.	1½ qt.	1½ qt. + ⅔ c.

TABLE 2 - continued
Page 2

25	50	75	100	200	300	400	500	600	700	800	900	1000
3 T.	6 T.	½ c.+ 1 T.	¾ c.	1½ c.	2¼ c.	3 c.	3 ¾ c.	1 qt. + ½ c.	1¼ qt. + ¼ c.	1½ qt.	1½ qt. + ¾ c.	1¾ qt. + ½ c
¼ c.	½ c.	¾ c.	1 c.	2 c.	3 c.	1 qt.	1¼ qt.	1½ qt.	1¾ qt.	2 qt.	2¼ qt.	2½ qt.
¼ c.+ 1T.	½ c.+ 2 T.	¾ c.+ 3T.	1¼ c.	2½ c.	3¾ c.	1¼ qt.	1½ qt. + ¼ c.	1¾ qt. + ½ c.	2 qt. + ¾ c.	2½ qt.	2¾ qt. + ¼ c.	3 qt. + ½ c.
⅓ c.	⅔ c.	1 c.	1⅓ c.	2⅔ c.	1 qt.	1¼ qt. + ⅓ c.	1½ qt. + ⅔ c.	2 qt.	2¼ qt. + ⅓ c.	2½ qt. +⅔ c	3 qt.	3¼ qt. + ⅓ c.
⅓c.+ 2 t	¾ c.	1 c.+ 2T.	1½ c.	3 c.	1 qt.+ ½c.	1½ qt.	1¾ qt. + ½ c.	2¼ qt.	2½ qt. + ½ c.	3 qt.	3¼ qt. + ½ c.	3¾ qt.
6T.+ 2 t.	¾ c.+ 4t.	1¼ c.	1⅔ c.	3⅓ c.	1¼ qt.	1½ qt. + ⅔ c.	2 qt.+⅓ c	2½ qt.	2¾ qt. + ⅔ c.	3¼ qt. +⅓ c.	3¾ qt.	1 gal+⅔ c.
¼ c.+ 3T.	¾ c.+ 2T.	1¼ c. + 1T.	1¾ c.	3½ c.	1¼ qt. + ¼ c.	1¾ qt.	2 qt.+¾ c	2½ qt. + ½ c.	3 qt.+¼ c.	3½ qt.	3¾ qt. + ¾ c.	1 gal. + 1½ c.
½ c.	1 c.	1½ c.	2 c.	1 qt.	1½ qt.	2 qt.	2½ qt.	3 qt.	3½ qt.	1 gal.	1 gal.+ 2 c.	1 gal.+ 1qt.
½ c.+ 1T.	1 c.+ 2T.	1½ c. + 3T.	2¼ c.	1 qt. + ½ c.	1½ qt. + ¾ c.	2¼ qt.	2¾ qt. + ¼ c.	3¼ qt. + ½ c.	3¾ qt. + ¾ c.	1 gal. + 2 c.	1¼ gal. + ¼ c.	1¼ gal. + 2½ c.
½ c.+ 4t.	1 c.+ 2 T. + 2 t.	1¾ c.	2⅓ c.	1 qt. + ⅔ c.	1¾ qt.	2¼ qt. + ⅓ c.	2¾ qt. + ⅔ c.	3½ qt.	1 gal. + ⅓ c.	1 gal. + 2⅔ c.	1¼ gal. + 1 c.	1¼ gal. + 3⅓ c.
½ c.+ 2T.	1¼ c.	1¾ c. + 2 T.	2½ c.	1¼ qt.	1¾ qt. + ½ c.	2½ qt.	3 qt. + ½ c.	3¾ qt.	1 gal. + 1½ c.	1¼ gal.	1¼ gal. + 2½ c.	1½ gal. + 1 c.
⅔ c.	1⅓ c.	2 c.	2⅔ c.	1¼ qt. + ⅓ c.	2 qt.	2½ qt. + ⅔ c.	3 qt. +1⅓ c.	1 gal.	1 gal. + 2⅔ c.	1¼ gal. +1⅓ c.	1½ gal.	1½ gal. + 2⅔ c.
½ c.+ 3T.	1¼ c. + 2T.	2c.+ 1 T.	2¾ c.	1¼ qt. + ½ c.	2 qt.+ ¼ c.	2¾ qt.	3¼ qt. + ¾ c.	1 gal. + ½ c.	1 gal. + 3¼ c.	1¼ gal. + 2 c.	1½ gal. + ¾ c.	1½ gal. + 3½ c.
¾ c.	1½ c.	2¼ c.	3 c.	1½ qt.	2¼ qt.	3 qt.	3¾ qt.	1 gal. + 2 c.	1¼ gal. + 1 c.	1½ gal.	1½ gal. + 3 c.	1¾ gal. + 2 c.
¾c.+ 1T.	1½ c. + 2 T.	2¼ c. + 3T.	3¼ c.	1½ qt. + ½ c.	2¼ qt. + ¾ c.	3¼ qt.	1 gal. + ¼ c.	1gal. + 3½ c.	1¼ gal. + 2¾ c.	1½ gal. + 2 c.	1¾ gal. + 1¼ c.	2 gal. + ½ c.
¾c.+ 4t.	1⅔ c.	2½ c.	3⅓ c.	1½ qt. + ⅔ c.	2½ qt.	3¼ qt. + ⅓ c.	1 gal. + ⅔ c.	1¼ gal.	1¼ gal. + 3⅓ c.	1½ gal. + 2⅔c.	1¾ gal. + 2 c.	2 gal. + 1⅓ c.
¾c.+ 2T.	1¾ c.	2½ c. + 2 T.	3½ c.	1¾ qt.	2½ qt. + ½ c.	3½ qt.	1 gal. + 1½ c.	1¼ gal. + 1 c.	1½ gal. +½ c.	1¾ gal.	1¾ gal. + 3½ c.	2 gal. + 2½ c.

TABLE 2 - continued
Page 3

25	50	75	100	200	300	400	500	600	700	800	900	1000
¾ c.+ 2T. +2½ t.	1¾ c. + 4 t.	2¾ c. + ½ t.	3⅔ c.	1¾ qt. + ⅓ c.	2¾ qt.	3½ qt. +⅔ c.	1 gal. + 1⅔ c.	1¼ gal. + 1⅓ c.	1½ gal. + 2 c.	1¾ gal. + 1⅔ c.	2 gal. + 1⅓ c.	2¼ gal. + 1 c.
¾c.+ 3T.	1¾ c. + 2T.	2¾ c. + 1 T.	3¾ c.	1¾ qt. + ½ c.	3 qt. + ¼ c.	1 gal.	1 gal. +3¾ c.	1¼ gal. + 3½ c.	1½ gal. + 3¼ c.	1¾ gal. + 3 c.	2 gal. + 2¾ c.	2¼ gal. + 2½ c.
1 c	2 c.	3 c.	1 qt.	2 qt.	3 qt.	1 gal.	1¼ gal.	1½ gal.	1¾ gal.	2 gal.	2¼ gal.	2½ gal.
1¼ c.	2½ c.	3¾ c.	1¼ qt.	2½ qt.	3¾ qt.	1¼ gal.	1½ gal. + 1 c.	1¾ gal. + 2 c.	2 gal. + 3 c.	2½ gal.	2¾ gal. + 1 c.	3 gal. + 2 c.
1½ c.	3 c.	1 qt. + ½ c.	1½ qt.	3 qt.	1 gal. + 2 c.	1½ gal.	1¾ gal. + 2 c.	2¼ gal.	2½ gal. + 2 c.	3 gal.	3¼ gal. + 2 c.	3¾ gal.
1¾ c.	3½ c.	1¼ qt. + ¼ c.	1¾ qt.	3½ qt.	1¼ gal. + 1 c.	1¾ gal.	2 gal. + 3 c.	2½ gal. + 2 c.	3 gal. + 1 c.	3½ gal.	3¾ gal. + 3 c.	4¼ gal. + 2 c.
2 c.	1 qt.	1½ qt.	2 qt.	1 gal.	1½ gal.	2 gal.	2½ gal.	3 gal.	3½ gal.	4 gal.	4½ gal.	5 gal.
2¼ c.	1 qt. + ½ c.	1½ qt. +¾ c.	2¼ qt.	1 gal. + 2 c.	1½ gal. + 3 c.	2¼ gal.	2¾ gal. + 1 c.	3¼ gal. + 2 c.	3¾ gal. + 3 c.	4½ gal.	5 gal. + 1 c.	5½ gal. + 2 c.
2½ c.	1¼ qt.	1¾ qt. + ½ c.	2½ qt.	1¼ gal.	1¾ gal. + 2 c.	2½ gal.	3 gal. + 2 c.	3¾ gal.	4¼ gal. + 2 c.	5 gal.	5½ gal. + 2 c.	6¼ gal.
2 ¾ c.	1¼ qt. + ½ c.	2 qt. + ¼ c.	2 ¾ qt.	1¼ gal. + 2 c.	2 gal. + 1 c.	2¾gal.	3¼ gal. + 3 c.	4 gal. + 2 c.	4¾gal. + 1 c.	5½ gal.	6 gal. + 3 c.	6¾ gal. + 2 c.
3 c.	1½ qt.	2¼ qt.	3 qt.	1½ gal.	2¼ gal.	3 gal.	3¾ gal.	4½ gal.	5¼ gal.	6 gal.	6¾ gal.	7½ gal.
3¼ c.	1½ qt. + ½ c.	2¼ qt. + ¾ c.	3¼ qt.	1½ gal. + 2 c.	2¼ gal. + 3 c.	3¼ gal.	4 gal. + 1 c.	4¾ gal. + 2 c.	5½ gal. + 3 c.	6½ gal.	7¼ gal. + 1 c.	8 gal. + 2 c.
3½ c.	1¾ qt.	2½ qt. + ½ c.	3½ qt.	1¾ gal.	2½ gal. + 2 C.	3½ gal.	4¼ gal. + 2 c.	5¼ gal.	6 gal. + 2 c.	7 gal.	7¾ gal. + 2 c.	8¾ gal.
3¾ c.	1¾ qt. + ½ c.	2¾ qt. + ¼ c.	3¾ qt.	1¾ gal. + 2 c.	2¾ gal. + 1 c.	3¾ gal.	4½ gal. + 3 c.	5½ gal. + 2 c.	6½ gal. + 1 c.	7½ gal.	8¼ gal. + 3 c.	9¼ gal. + 2 c.
1 qt.	2 qt.	3 qt.	1 gal.	2 gal.	3 gal.	4 gal.	5 gal.	6 gal.	7 gal.	8 gal.	9 gal.	10 gal.
1¼ qt.	2½ qt.	3¾ qt.	1¼ gal.	2½ gal.	3 ¾ gal.	5 gal.	6¼ gal.	7½ gal.	8¾ gal.	10 gal.	11¼ gal.	12½ gal.
1½ qt.	3 qt.	1 gal. + 2 c.	1½ gal.	3 gal.	4½ gal.	6 gal.	7½ gal.	9 gal.	10½ gal.	12 gal.	13½ gal.	15 gal.

TABLE 2 - continued
Page 4

25	50	75	100	200	300	400	500	600	700	800	900	1000
1¾ qt.	3½ qt.	1¼ gal. + 1 c.	1¾ gal.	3½ gal.	5¼ gal.	7 gal.	8¾ gal.	10½ gal.	12¼ gal.	14 gal.	15¾ gal.	17½ gal.
2 qt.	1 gal.	1½ gal.	2 gal.	4 gal.	6 gal.	8 gal.	10 gal.	12 gal.	14 gal.	16 gal.	18 gal.	20 gal.
2¼ qt.	1 gal. + 2 c.	1½ gal. + 3 c.	2¼ gal.	4½ gal.	6¾ gal.	9 gal.	11¼ gal.	13½ gal.	15¾ gal.	18 gal.	20¼ gal.	22½ gal.
2½ qt.	1¼ gal.	1¾ gal. + 2 c.	2½ gal.	5 gal.	7½ gal.	10 gal.	12½ gal.	15 gal.	17½ gal.	20 gal.	22½ gal.	25 gal.
2¾ qt.	1¼ gal. + 2 c.	2 gal. + 1 c.	2¾ gal.	5½ gal.	8¼ gal.	11 gal.	13¾ gal.	16½ gal.	19¼ gal.	22 gal.	24¾ gal.	27½ gal.
3 qt.	1½ gal.	2¼ gal.	3 gal.	6 gal.	9 gal.	12 gal.	15 gal.	18 gal.	21 gal.	24 gal.	27 gal.	30 gal.
3 qt. + 1 c.	1½ gal. + 2 c.	2¼ gal. + 3 c.	3¼ gal.	6½ gal.	9¾ gal.	13 gal.	16¼ gal.	19½ gal.	22¾ gal.	26 gal.	29¼ gal.	32½ gal.
3½ qt.	1¾ gal.	2½ gal. + 2 c.	3½ gal.	7 gal.	10½ gal.	14 gal.	17½ gal.	21 gal.	24½ gal.	28 gal.	31½ gal.	35 gal.
3½ qt. + 1 c.	1¾ gal. + 2 c.	2¾ gal. + 1 c.	3¾ gal.	7½ gal.	11¼ gal.	15 gal.	18¾ gal.	22½ gal.	26¼ gal.	30 gal.	33¾ gal.	37½ gal.
1 gal.	2 gal.	3 gal.	4 gal.	8 gal.	12 gal.	16 gal.	20 gal.	24 gal.	28 gal.	32 gal.	36 gal.	40 gal.
1 gal.+ 1c.	2 gal.+2c.	3 gal.+3c.	4¼ gal.	8½ gal.	12¾ gal.	17 gal.	21¼ gal.	25½ gal.	29¾ gal.	34 gal.	38¼ gal.	42½ gal.
1 gal.+ 2c.	2¼ gal.	3¼ gal. + 2 c.	4½ gal.	9 gal.	13½ gal.	18 gal.	22½ gal.	27 gal.	31½ gal.	36 gal.	40½ gal.	45 gal.
1 gal.+ 3c.	2¼ gal. + 2 c.	3½ gal. + 1 c.	4¾ gal.	9½ gal.	14¼ gal.	19 gal.	23¾ gal.	28½ gal.	33¼ gal.	38 gal.	42¾ gal.	47½ gal.
1¼ gal.	2½ gal.	3¾ gal.	5 gal.	10 gal.	15 gal.	20 gal.	25 gal.	30 gal.	35 gal.	40 gal.	45 gal.	50 gal.
1¼ gal. + 1 c.	2½ gal. + 2 c.	3¾ gal. + 3 c.	5¼ gal.	10½ gal.	15¾ gal.	21 gal.	26¼ gal.	31½ gal.	36¾ gal.	42 gal.	47¼ gal.	52½ gal.
1¼ gal. + 2 c.	2¾ gal.	4 gal. + 2 c.	5½ gal.	11 gal.	16½ gal.	22 gal.	27½ gal.	33 gal.	38½ gal.	44 gal.	49½ gal.	55 gal.
1¼ gal. + 3 c.	2¾ gal. + 2 c.	4¼ gal. + 1 c.	5¾ gal.	11½ gal.	17¼ gal.	23 gal.	28¾ gal.	34½ gal.	40¼ gal.	46 gal.	51¾ gal.	57½ gal.

TABLE 2 - continued
Page 5

25	50	75	100	200	300	400	500	600	700	800	900	1000
1½ gal.	3 gal.	4½ gal.	6 gal.	12 gal.	18 gal.	24 gal.	30 gal.	36 gal.	42 gal.	48 gal.	54 gal.	60 gal.
1½ gal. + 1 c.	3 gal. + 2 c.	4½ gal. + 3 c.	6¼ gal.	12½ gal.	18¾ gal.	25 gal.	31¼ gal.	37½ gal.	43¾ gal	50 gal.	56¼ gal.	62½ gal.
1½ gal. + 2 c.	3¼ gal.	4¾ gal. + 2 c.	6½ gal.	13 gal.	19½ gal.	26 gal.	32½ gal.	39 gal.	45½ gal.	52 gal.	58½ gal.	65 gal.
1½ gal. + 3 c.	3¼ gal. + 2 c.	5 gal. + 1 c.	6¾ gal.	13½ gal.	20¼ gal.	27 gal.	33¾ gal.	40½ gal.	47¼ gal.	54 gal.	60¾ gal.	67½ gal.
1¾ gal.	3½ gal.	5¼ gal.	7 gal.	14 gal.	21 gal.	28 gal.	35 gal.	42 gal.	49 gal.	56 gal.	63 gal.	70 gal.

Instructions for Using Table 3 Which Follows:

1. Locate column which corresponds to the original yield of the recipe you wish to adjust. For example, let us assume your original custard sauce recipe yields 24 portions. Locate the 24 column.
2. Run your finger down this column until you come to the amount of the ingredient required (or closest to this figure) in the recipe you wish to adjust. Say that your original recipe for 24 portions requires 1¼ T. cornstarch and 1¼ qt. milk. Run your finger down the column headed 24 until you come to 1⅓ T. (for cornstarch) and then 1¼ qt. (for milk), etc.
3. Next, run your finger across the page, in line with that amount, until you come to the column which is headed to correspond with the yield you desire. Suppose you want to make 64 portions. Starting with your finger under the 1⅓ T. (in the 24 column), slide it across to the column headed 64 and read the figure. You need ¼ c. cornstarch for 64 portions. Repeat the procedure starting with 1¼ qt. in the 24 column; tracing across to the 64 column, you find you need 3¼ qt. + ⅓ c. milk.
4. Record this figure as the amount of the ingredient required for the new yield of your recipe.

   Repeat Steps 1,2,3 for each ingredient in your original recipe to obtain the adjusted measure needed of each for your new yield. You can increase or decrease yield in this manner.
5. If you need to combine two columns to obtain your desired yield, follow the above procedure and add together the amounts given in the two columns to get the amount required for your adjusted yield. For example, to find the amount of cornstarch needed for 124 portions of pudding (using the same basic recipe as above) locate the figures in columns 60 and 64 and add them. In this case you would add 3 T. + 2¼ t. and ¼ c.
6. The figures in Table 3 are given in measurements which provide absolute accuracy. After you have made yield adjustments for all ingredients refer to Table 4 for "rounding-off" awkward fractions and complicated measurements. In our example (increasing from 24 to 64 portions) you can "round" the adjusted amount of milk to 3¼ qt. without upsetting proportions. The total amount of cornstarch in our example need not be "rounded-off" since it can be measured easily (¼ c.).

TABLE 3 - Direct-reading table for adjusting yield of recipes with ingredient amounts given in measurement. (This table is primarily for use with recipes with original or desired portion yields which can be divided by 8, yields of 20 and 60 portions are also included).

ABBREVIATIONS IN TABLE:

t. = teaspoon	gal. = gallon
T. = tablespoon	(r) = slightly rounded
c. - cup	(s) = scant
qt. = quart	(a) = too small for measure; use caution

BASIC INFORMATION

Measuring spoons
1 T.
1 t.
½ t.
¼ t.
for ¾ t. combine ½ T. + ¼ t.
for ⅛ t. use half of the ¼t.

3 t.= 1T.
4 T.= ¼c.
5T. + 1t. = ⅓ c.
8T. = ½ c.
10T. + 2t. = ⅔ c.

12 T. = ¾ c.
16 T. = 1 c.
4 c. = 1 qt.
4 qt.= 1 gal.

8	16	20	24	32	40	48	56	60	64	72	80	88	96
(a) (a) ¼ t. (s) ¼ t.	(a) ⅛ t.(r) ¼ t. (r) ½ t.	⅛ t.(s) ¼ t. (s) ½t. (s) ½ t. (r)	⅛ t. ¼ t. ½ t. ¾ t.	⅛ t.(r) ¼ t. (r) ¾ t.(s) 1 t.	¼ t. (s) ½ t. (s) ¾ t.(r) 1¼ t.	¼ t. ½ t. 1 t. 1½ t.	¼ t. (r) ½ t. (r) 1¼ t. (s) 1¾ t.	¼ t. (r) ½ t. (r) 1¼ t. 1¾ t. (r)	¼ t. (r) ¾t. (s) 1¼ t. (r) 2 t.	¼ t.+⅛ t. ¾ t. 1½ t. 2¼ t.	½ t. (s) ¾t. (r) 1¾t. (s) 2½ t.	½ t. (s) 1 t. (s) 1¾t. (r) 2¾ t.	½ t. 1 t. 2 t. 1 T.
¼ t. (r) ½ t. (s) ½ t.	¾ t.(s) ¾ t.(r) 1 t.	¾ t. (r) 1 t. 1¼ t.	1 t. 1¼ t. 1½ t.	1¼ t. (r) 1¾ t.(s) 2 t.	1¾ t.(s) 2 t. 2½ t.	2 t. 2½ t. 1T.	2¼ t.(r) 1T. (s) 1 T.+ ½ t.	2½ t. 1T.+ ⅛ t. 1 T.+¾ t.	2¾ t.(s) 1T. + ¼ t. 1T. + 1 t.	1 T. 1 T.+ ¾t. 1½ T.	1T. + ¼ t. 1T.+ 1¼ t. 1T.+ 2 t.	1T.+ ¾ t. 1½ T. 1 T.+ 2½ t.	1T.+ 1 t. 1T.+2 t. 2 T.
½ t.(r)	1¼ t.(s)	1½ t.	1¾ t.	2¼ t.(r)	1 T. (s)	1T.+ ½ t.	1T.+ 1 t.	1T.+ 1¼ t. + ⅛ t.	1T.+ 1¾ t.	1T.+ 2¼ t.	1T.+ 2¾ t.	2T. + ½ t.	2 T. + 1t.
¾ t. (s) ¾ t.	1¼ t. (r) 1½ t.	1¾ t. (s) 1¾ t.(r)	2 t. 2¼ t.	2¾ t. (r) 1 T.	1T.+ ¼ t. 1T.+ ¾ t.	1T. + 1 t. 1T.+ 1½ t.	1T. + 1¾t 1T.+ 2¼ t.	1T. + 2 t. 1T.+ 2½ t.	1T.+ 2¼ t. 2 T.	2 T. 2T.+ ¾ t.	2T.+ ¾ t. 2½ T.	2T. + 1¼ t 2T.+ 2¼ t.	2T.+ 2 t. 3 T.
⅞ t. (r)	1¾ t.(s)	2 t.	2½ t.	1T.+ ¼ t. (r)	1T.+ 1¼ t.	1T.+ 2 t.	1T.+ 2¾ t (r)	2T.+ ¼ t.	2T.+ ¾ t.	2T. + 1½ t	2T.+ 2¼ t.	3 T.	3T.+ 1t.
1 t. (s)	1¾ t.(r)	2¼ t.(r)	2¾ t.	1T.+ ¾ t. (s)	1T.+ 1½ t.	1T.+ 2½ t.	2T.+ ½ t.	2T.+ ¾ t.	2T.+ 1¼ t.	2T.+ 2½ t.	3 T.	3T.+ 1 t.	3T.+ 2 t.
1 t.	2 t.	2½ t.	1 T.	1T.+ 1 t.	1T. + 2 t.	2T.	2T.+ 1 t.	2½ T.	2 T.+ 2 t.	3 T.	3T.+ 1 t.	3T.+ 2 t.	¼ c.
1½ t.	1 T.	1T.+ ¾ t.	1½ T.	2 T.	2½ T.	3 T.	3½ T.	3T.+ 2¼ t.	¼ c.	¼ c. + 1½ t.	¼ c. + 1 T.	⅓ c. + ½ t.	⅓ c. + 2 t.
2 t.	1T.+ 1 t.	1T.+ 2 t.	2 T.	2 T.+ 2 t.	3 T.+ 1 t.	¼ c.	¼ c.+ 2 t	¼ c.+ 1T.	⅓ c.	⅓c.+ 2 t	⅓ c.+ 4t.	⅓ c.+ 2T.	½ c.

TABLE 3 - continued
Page 2

8	16	20	24	32	40	48	56	60	64	72	80	88	96
2½ t.	1T.+ 2 t.	2T.+ ¼ t.	2½ T.	3T.+ 1 t.	¼ c.+ ½ t.	¼ c.+ 1T.	⅓ c. + ½ T.	⅓ c. +2¾ t.	⅓ c. + 4 t.	¼ c. + 3½ T.	½ c.+ 1t.	½ c. + 3½ t.	½c.+ 2T.
1 T.	2 T.	2½ T.	3 T.	¼ c.	¼ c.+ 1T.	⅓ c.+ 2 t.	¼ c. + 3T.	¼ c. + 3½ T.	½ c.	½ c.+ 1 T.	½ c. + 2T.	½ c.+ 3 T.	¾ c.
1T.+ ½ t.	2T.+ 1 t.	2 T. + 2¾ t.	3½ T.	¼ c.+ 2 t.	⅓ c. + ½ T.	¼ c.+ 3T.	½ c.+ ½ t.	½ c. + 2¼ t.	½ c.+ 4 t.	½ c. + 2½ T.	⅔ c.+ 1T.	¾ c. + 2½ t.	¾ c.+ 2T.
1T.+ 1 t.	2T. + 2 t.	3T.+ 1 t.	¼ c.	⅓ c.	⅓ c.+ 4 t.	½ c.	½ c.+ 4 t.	½ c.+ 2 T.	⅔ c.	¾ c.	¾ c.+ 4 t.	¾ c. + 2½ T.	1 c.
1T. + 2¼ t.	3T. + 2¾ t.	¼ c. + 1¼ t.	⅓ c.	¼ c. + 3 T.	½ c. + 2½ t.	⅔ c.	¾ c. + ½ T.	¾ c. + 4 t.	¾ c. + 2 T.	1 c.	1 c. + 5 t.	1 c. + 3½ T.	1⅓ c.
2T.+ 2 t.	⅓ c.	⅓ c. + 2T.	½ c.	⅔ c.	¾ c. + 4 t.	1 c.	1 c. + 2½ T.	1¼ c.	1⅓ c.	1½ c.	1⅔ c.	1¾ c. + 4 t.	2 c.
3T. + 1¾ t.	⅓ c. + 5 t.	½ c. + 2¾ t.	⅔ c.	¾ c. + 2 T.	1 c. + 5½ t.	1⅓ c.	1½ c. + 1 T.	1⅔ c.	1¾ c.	2 c.	2 c. + 3½ T.	2¼ c. + 3 T.	2⅔ c.
¼ c.	½ c.	½ c. + 2 T.	¾ c.	1 c.	1¼ c.	1½ c.	1¾ c.	1¾ c. + 2T.	2 c.	2¼ c.	2½ c.	2¾ c.	3 c.
⅓ c.	⅔ c.	¾ c.+ 2t.	1 c.	1⅓ c.	1⅔ c.	2 c.	2⅓ c.	2½ c.	2⅔ c.	3 c.	3⅓ c.	3⅔ c.	1 qt.
⅓ c.+ 4t	¾ c.+ 4 t.	1 c.+ 2t.	1¼ c.	1⅔ c.	2C.+ 4 t.	2½ c.	2¾ c. + 2½ T.	3c.+ 2T.	3⅓ c.	3¾ c.	1 qt. + 2½ T.	4½c.+ 4 t.	1¼ qt.
⅓ c. + 5¼ t.	⅔ c. + 3½ T.	1 c. + 5¼ t.	1⅓ c.	1¾ c. + 1¼ t.	2 c. + 3½ T.	2⅔ c.	3 c. + 2 T.	3⅓ c.	3½ c. + 2½ t.	1 qt.	4¼ c. + 3 T.	4¾ c. + 2T.+ 1t.	1¼ qt. + ⅓ c.

TABLE 3 - continued
Page 3

8	16	20	24	32	40	48	56	60	64	72	80	88	96
½ c.	1 c.	1¼ c.	1½ c.	2 c.	2½ c.	3 c.	3½ c.	3¾ c.	1 qt.	1 qt. + ½ c.	1¼ qt.	1¼ qt. + ½ c.	1½ qt.
½ c. + 2¼ t.	1 c. + 5¼ t.	1⅓ c.	1⅔ c.	2 c. + 3½ T.	2⅔ c.	3⅓ c.	3¾ c. + 2 T.	1 qt. + 2½ T.	4¼ c. + 3 T.	1¼ qt.	1¼ qt. + ⅓ c.	1½ qt. + 5 t.	1½ qt. + ⅔ c.
½ c. + 4 t.	1 c. + 3 T.	1⅓ c. + 2 T.	1¾ c.	2⅓ c.	2¾ c. + 1½ T.	3½ c.	1 qt. + 4 t.	1 qt. + ¼ c.+ 2T.	1 qt. + ⅔ c.	1¼ qt. + ¼ c.	5½ c. + 3 T.	1½ qt. + ¼ c.+ 2½T.	1¾ c.
⅔ c.	1⅓ c.	1⅔ c.	2 c.	2⅔ c.	3⅓ c.	1 qt.	1 qt. + ⅔ c.	1¼ qt.	1¼ qt. + ⅓ c.	1½ qt.	1½ qt. + ⅔ c.	1¾ qt. + ⅓ c.	2 qt.
¾ c.	1½ c.	1¾ c. + 2 T.	2¼ c.	3 c.	3¾ c.	1 qt. + ½ c.	1¼ qt. + ¼ c.	1¼ qt. + ⅔ c.	1½ qt.	1½ qt. + ¾ c.	1¾ qt. + ½ c.	2 qt. + ¼ c.	2¼ qt.
¾ c. + 1¼ t.	1½ c. + 2¾ t.	1¾ c. + 3 T.	2⅓ c.	3 c. + 2 T.	3¾ c. + 2 T.	1 qt. + ⅔ c.	5¼ c. + 3 T.	5¾ c. + 1½ T.	1½ qt. + ¼ c.	1¾ qt.	1¾ qt. + ¾ c.	2 qt. + ½ c.+ 1 T.	2¼ qt. + ⅓ c.
¾ c. + 4 t.	1⅔ c.	2 c. + 4 t.	2½ c.	3⅓ c.	1 qt. + 2½ T.	1¼ qt.	5¾ c. + 1 T.	1½ qt. + ¼ c.	1½ qt. + ⅔ c.	1¾ qt. + ½ c.	2 qt. + 5 T.	2¼ qt. + 3 T.	2½ qt.
⅔ c. + 3½ T.	1¾ c. + 1¼ t.	2 c. + 3½ T.	2⅔ c.	3½ c. + 1 T.	4¼ c. + 3 T.	1¼ qt. + ⅓ c.	1½ qt. + ¼ c.	1½ qt. + ⅔ c.	1¾ c. + 2 T.	2 qt.	2 qt. + ¾ c.+ 2 T.	2¼ qt. + ¾ c.+ ½ T.	2½ qt + ⅔ c.
⅔ c. + ¼ c.	1¾ c. + 4 t.	2¼ c. + 2 t.	2¾ c.	3⅔ c.	4½ c. + 4 t.	1¼ qt. + ½ c.	1½ qt. + ¼ c.+ 3 T.	1½ qt. + ¾ c.+ 2T.	1¾ qt. + ⅓ c.	2 qt. + ¼ c.	2¼ qt. + 2½ T.	2½ qt. + 1½ T.	2¾ qt.
1 c.	2 c.	2½ c.	3 c.	1 qt.	1¼ qt.	1½ qt.	1¾ qt.	1¾ qt. + ½ c.	2 qt.	2¼ qt.	2½ qt.	2¾ qt.	3 qt.
1 c. + 4 t.	2 c. + 2½ T.	2⅔ c. + 2 t.	3¼ c.	1 qt. + ⅓ c.	5⅓ c. + 4 t.	1½ qt. + ½ c.	1¾ qt. + ⅓ c.+ ¼c.	2 qt. + 2 T.	2 qt. + ⅔ c.	2¼ qt. + ¾ c.	2½ qt. + ¾c.+ 1½ T.	2¾ qt. + ¾ c.+ 3T.	3¼ qt.

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TABLE 3 - continued
Page 4

8	16	20	24	32	40	48	56	60	64	72	80	88	96
1 c. + 5¼ t.	2 c. + 3½ T.	2¾ c. + ½ T.	3⅓ c.	4¼ c. + 3 T.	5½ qt. + 1 T.	1½ qt. + ⅔ c.	1¾ qt. + ¾ c.	2 qt. + ⅓ c.	2 qt. + ¾ c.+ 2T.	2½ qt.	2¾ qt. + 2 T.	3 qt. + ¼ c.	3¼ qt. + ⅓ c.
1 c. + 2T.+ 2 t.	2¼ c. + 4 t.	2¾ c. + 2½ T.	3½ c.	1 qt. + ⅔ c.	5¾ c. + 1 T.	1¾ qt.	2 qt. + 3 T.	2 qt. + ¾ c.	2¼ qt. + ⅓ c.	2½ qt. + ½ c.	2¾ qt. + ½ c.+ 2 T.	3 qt. + ¾ c.+ 1½T.	3½ qt.
1 c. + 3½ T.	2¼ c. + 3 T.	3 c.+ 1T.	3⅔ c.	4¾ c. + 2 T.	1½ qt. + 2 T.	1¾ qt. + ⅓ c.	2 qt. + ½ c. + 1T.	2¼ qt. + 2½ T.	2¼ qt. + ¾ c.	2¾ qt.	3 qt. + ¼ c.	3¼ qt. + ¼ c.+ 3 T.	3 qt. + 2⅔ c.
1¼ c.	2½ c.	3 c. + 2 T.	3¾ c.	1¼ qt.	1½ qt. + ¼ c.	1¾ qt. + ½ c.	2 qt. + ¾ c.	2¼ qt. + ¼ c.+ 2 T.	2½ qt.	2¾ qt. + ¼ c.	3 qt. + ½ c.	3 qt. + 1¾ c.	3 qt. + 3 c.
1⅓ c.	2⅔ c.	3⅓ c.	1 qt.	1¼ qt. + ⅓ c.	1½ qt. + ⅔c.	2 qt.	2 qt. + 1⅓ c.	2½ qt.	2¾ qt. + ⅓ c.	3 qt.	3 qt. + 1⅓ c.	3 qt. + 2⅔ c.	1 gal.
1⅔ c.	3⅓ c.	1 qt. + 2½ T.	1¼ qt.	1½ qt. + ⅔ c.	2 qt. + ¼ c.+ 1 T.	2½ qt.	2¾ qt. + ⅔ c.	3 qt. + ½ c.	3¼ qt. + ⅓ c.	3¾ qt.	1 gal. + ⅔ c.	1 gal. + 2⅓ c.	1¼ gal.
2 c.	1 qt.	1¼ qt.	1½ qt.	2 qt.	2½ qt.	3 qt.	3½ qt.	3¾ qt.	1 gal.	1 gal. + 2 c.	1¼ gal.	1¼ gal. + 2 c.	1½ gal.
2½ c.	1 qt. + ⅔ c.	5¾ c. + 1½ T.	1¾ qt.	2¼ qt. + ⅓ c.	2¾ qt. + ⅔ c.	3½ qt.	1 gal. + ⅓ c.	1 gal. + 1½ c.	1 gal. + 2⅔ c.	1¼ gal. + 1 c.	1¼ gal. + 3⅓ c.	1½ gal. + 1⅔ c.	1¾ gal
2⅔ c.	1¼ qt. + ⅓ c.	1½ qt. + ⅔ c.	2 qt.	2½ qt. + ⅔	3¼ qt. + ⅓ c.	1 gal.	1 gal. + 2⅔ c.	1¼ gal.	1¼ gal. + 1⅓c.	1½ gal.	1½ gal. + 2⅔ c.	1¾ gal. + 1⅓ c.	2 gal.

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TABLE 2 - continued
Page 5

8	16	20	24	32	40	48	56	60	64	72	80	88	96
3 c.	1½ qt.	1¾ qt. + ½ c.	2¼ qt.	3 qt.	3¾ qt.	1 gal. + 2 c.	1¼ gal. + 1 c.	1¼ gal. + 2½ c.	1½ gal.	1½ gal. + 3 c.	1¾ gal. + 2 c.	2 gal. + 1 c.	2¼ gal.
3⅓ c.	1½ qt. + ⅔ c.	2 qt. + ⅓ c.	2½ qt.	3¼ qt. + ⅓ c.	1 gal. + ⅔ c.	1¼ gal.	1¼ gal. + 3⅓ c.	1½ gal. + 1 c.	1½ gal. + 2⅔ c.	1¾ gal. + 2 c.	2 gal. + 1⅓ c.	2¼ gal. + ⅔ c.	2½ gal.
3⅔ c.	1¾ qt. + ⅓ c.	2¼ qt. + 2½ T.	2¾ qt.	3½ qt. + ⅔ c.	1 gal. + 2⅓ c.	1¼ gal. + 2 c.	1½ gal. + 1⅔ c.	1½ gal. + 3½ c.	1¾ gal. +1⅓ c.	2 gal. + 1 c.	2¼ gal. + ⅔ c.	2½ gal. + ⅓ c.	2¾ gal.
1 qt.	2 qt.	2½ qt.	3 qt.	1 gal.	1¼ gal.	1½ gal.	1¾ gal.	1¾ gal. + 2 c.	2 gal.	2¼ gal.	2½ gal.	2¾ gal.	3 gal.
1 qt. + ⅓ c.	2 qt. + ⅔ c.	2½ qt. + ¾ c.+ 1½ T.	3¼ qt.	1 gal. +1⅓ c.	1¼ gal. + 1⅔ c.	1½ gal. + 2 c.	1¾ gal. + 2⅓ c.	2 gal. + ½ c.	2 gal. + 2⅔ c.	2¼ gal. + 3 c.	2½ gal. + 3⅓ c.	2¾ gal. + 3⅔ c.	3¼ gal.
1 qt. + ⅔ c.	2¼ qt. + ⅓ c.	2 ¾ qt. + ⅔ c.	3½ qt.	1 gal. + 2⅔ c.	1¼ gal. + 3⅓ c.	1¾ gal.	2 gal. + ⅔ c.	2 gal. + 3 c.	2¼ gal. + 1⅓ c.	2½ gal. + 2 c.	2¾ gal. + 2⅔ c.	3 gal. + 3⅓ c.	3½ gal.
1¼ qt.	2½ qt.	3 qt. + ½ c.	3¾ qt.	1¼ gal.	1½ gal. + 1 c.	1¾ gal. + 2 c.	2 gal. + 3 c.	2¼ gal. + 1½ c.	2½ gal.	2¾ gal. + 1 c.	3 gal. + 2 c.	3¼ gal. + 3 c.	3¾ gal.
1¼ qt. + ⅓ c.	2½ qt. + ⅔ c.	3 qt. + 1⅓ c.	1 gal.	1¼ gal. + 1⅓ c.	1½ gal. + 2⅔ c.	2 gal.	2¼ gal. + 1⅓ c.	2½ gal.	2½ gal. + 2⅔ c.	3 gal.	3¼ gal. + 1⅓ c.	3½ gal. + 2⅔ c.	4 gal.
1½ qt. + ⅔ c.	3¼ qt. + ⅓ c.	1 gal. + ⅔ c.	1¼ gal.	1½ gal. + 2⅔ c.	2 gal. + 1⅓ c.	2½ gal.	2¾ gal. + 2⅔ c.	3 gal. + 2 c.	3¼ gal. + 1⅓ c.	3¾ gal.	4 gal. + 2⅔ c.	4½ gal. + 1⅓ c.	5 gal.
2 qt.	1 gal.	1¼ gal.	1½ gal.	2 gal.	2½ gal.	3 gal.	3½ gal.	3¾ gal.	4 gal.	4½ gal.	5 gal.	5½ gal.	6 gal. ✓

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APPENDIX III-A

PROBLEMS, CAUSES AND CORRECTIONS IN PAN FRYING AND GRIDDLE SAUTEING

Problem	Cause	Correction
Food sticks	1. Not enough fat. 2. Food too cold 3. Surface needs conditioning 4. Surface too hot or cold	Use more fat or oil Thaw or warm food slightly Condition with fat as directed above Adjust temperature
Food burns	1. Surface too hot	Adjust heat
Food doesn't brown	1. Surface too cold	Adjust heat
Spattering	1. Most foods added to too hot fat	Drain moist foods thoroughly; reduce cooking temperature
Foods not crisp	1. Food too cold 2. Insufficient fat 3. Too low cooking temperature	Warm food Add more fat Adjust heat

Adapted from: Standards, Principles and Techniques in Quantity Food Production
by Lendal Kotschevar

APPENDIX III-B

PROBLEMS, CAUSES AND CORRECTIONS IN DEEP-FRYING

Problem	Causes	Corrections
Objectionable smoke	1. Temperature too high 2. Failure to strain fat frequently 3. Old fat	Use lower temperature; strain fat and store in cool place after use. Set up filtering schedule; check fat turnover.
Fat bubbles over	1. Too much fat in kettle 2. Too much food in kettle 3. Excessive moisture in food	Check fill of deep kettle; add smaller quantities to be fried in basket; drain batter-dipped or egg-and-crumbed foods; dry potatoes thoroughly
Foods not crisp	1. Frying temperature too low	Use high temperature for frying; use frying thermometer or check temperature with bread cube
Strong flavor and color	1. Old fat or deteriorated fat. 2. Wrong fat for frying	Keep used fat in cool place; select proper type of frying fat; strain after use; if too many strongly flavored foods must be fried in fat, discard after use.
Excessive foaming	1. Failure to strain fat 2. Deteriorated fat 3. Extremely cold foods added to hot fat. 4. Too much egg and crumb or batter. 5. Frying temperature too low	Strain fat before storing in cool, dry place; do not take foods directly from refrigerator to kettle; drain batter-dipped or egg-and-crumb foods; use correct temperature for frying; use thermometer or check temperature with bread cube; discard deteriorated fat.

Adapted from: Standards, Principles and Techniques in Quantity Food Production by Lendal Kotschevar.

APPENDIX III-C

TEMPERATURES RECOMMENDED FOR SAUTEING AND GRILLING

Item	Temperature °F	Approximate Cooking Time (Min)
Hamburger, thin	340-350	5 to 8
Griddle cakes	350-360	3 to 4
Eggs, fried	300-325	3 to 4
Bacon, ham or sausages	325	4 to 5 (if thin)
Steak, ½-in. thick	350	10 to 15 (well done)
Steak, 1-in. thick	340	10 to 15 (medium)
Steak, over 1-in thick	330	10 to 15 (rare)
Pork or veal cutlets	325	6 to 8
Small fish or fillets	350	10 to 15
Small steaks or chops	340-350	10 to 15
Potatoes, hash browns or American fries	350-360	8 to 10
Toasted sandwiches	350	4 to 5
French toast	325-330	3 to 4

Adapted from: Standards, Principles and Techniques in Quantity Food Production, by Lendal Kotschevar

APPENDIX IV

Handout #A8-6

INSTRUCTOR'S GUIDE FOR MEAT, POULTRY AND STARCH PREPARATION

1. Allow 20 to 30 minutes for participants to become familiar with the kitchen to be used, the location and operation of equipment, and the location of ingredients needed for the preparation of assigned recipes.

2. Divide participants into pairs and give each couple one of the recipes on Handouts #8-7 through #8-15 to prepare.

3. Ask each pair first to adjust the base recipe yield as noted on the top of the recipe. Ask them to use the Factor Method for adjusting this recipe, as was described in Lesson 2 on Standardized Recipes. The adjusted recipe ingredient amounts should be written in the blank column provided on each recipe.

4. After all products have been prepared, evaluate them using the form provided on Handout #8-3. Evaluation can be done by those who prepared each product or by other class participants.

5. Allow adequate time for all products to be prepared, cooled and evaluated.

6. While various products are being completed, participants who finish first can begin to clean up the kitchen facility used, and set up tasting forks and small liners to use during the evaluation of the products prepared.

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